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A KEY TO THE GENERA OF FREE-LIVING NEMAS

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PREFACE

This key, which was built up and used by N. A. Cobb as a card catalog during forty years of work in nematology, had been reorganized in rough manuscript form during the last two years of his life. As Miss Cooper and I had previously worked with him on this draft, it seemed best for us to carry it to completion. In essentials and in general form it is his key, but we are responsible both for correctness of detail (an appreciable amount of the detailed work was incomplete, in need of revision, or in need of change because of addition or omission of genera), and for such decisions as have to be made in getting such a work printed. Our aim has been to follow his ideas wherever they were known to us, or where we could infer them, and to make as few changes as possible in his outline. Nearly a hundred entries have been omitted, chiefly his own new genera which it has not been possible to publish in advance of publication of the key. In some cases genera have been dropped as not being free-living. Index, glossary and list of abbreviations have been added. The bibliography has been prepared by Mrs. Rowena R. LeHew of the Division of Nematology. The definitions in the glossary are not intended to settle the meaning of terms for other workers in the field, but merely to indicate the terminology used in this key.

A few details in the form of the key stand in need of special explanation. Parentheses have been used around generic names in the key in two ways; one, to indicate that the genus is better placed elsewhere in the key, and two, with an equality sign, to indicate a synonym for the accepted name of a genus. An example of this second use is given by the first genus entry in the key. The symbols ♀ for female, ♂ for male, and J for young or immature specimens are used throughout the key as a means of saving space; "♂ only," for instance, indicates that only the male form is known. The % sign is used to mean per-

cent of body length, or, distant from anterior end, measured in percent of body length.

In general the intention has been to include all synonyms, together with the corresponding accepted generic names. The case of Dichromadora and Trichromadora Kreis, 1929, is an exception; these designations seemed to cut across the accepted classification in such a way as to make their inclusion impracticable.

Through the much appreciated courtesy of the United States Bureau of Fisheries, a part of the work on the key had been carried out at its Laboratories at Woods Hole, Mass. Needless to say, the work could not have been completed or completion even attempted by us without the resources and the expert advice of the Division of Nematology, of the Bureau of Plant Industry, U. S. Department of Agriculture, within which the work has been done. Dr. G. Steiner and Dr. J. R. Christie have given never-failing aid. Dr. Maurice Hall and Dr. B. Chitwood of the Division of Zoölogy have also given generously of their time, their knowledge and their experience.

MARGARET V. COBB.

ABBREVIATIONS USED IN KEY

abs, absent
am'g, among
alt, alternative
amph, amphid
ant, anterior
card, cardiac
caud, caudal
ceph, cephalic
cerv, cervical
circ, circular
conspic, conspicuous
constrict, constriction
cutic, cuticular
cylind, cylindroid
dents, denticles
devel, developed
diam, diameter
exc, except
excret, excretory
ext, external
gub, gubernaculum
gubernac, gubernaculum
inconspic, inconspicuous
indef, indefinite
intest, intestine
irreg, irregular
J, young, juvenile
junct, junction

lab, labial
lat, lateral
long, longitudinal
mand, mandibular
med, median
no, number
nr, near
oes, oesophagus
oesoph, oesophagus
onch, onchium
opp, opposite
papill, papillae, papilloid
phar, pharynx, pharyngeal
pharyng, pharyngeal
post, posterior
pres, present
prob, probably
prs, pairs
reg, region
set, setae
stri, striae
subceph, subcephalic
sublat, sublateral
submed, submedian
term, terminal
undev, undeveloped

0 absent, none
\+ or more, plus
± more or less, somewhat, about
% per cent of body length
♂ male
♂ only only the male known
♀ female
'♀' ovaries 2, reflexed
-♀- ovaries 2, outstretched
'♀ ovary 1, anterior, reflexed
♀' ovary 1, posterior, reflexed
-♀ ovary 1, anterior, outstretched
♀- ovary 1, posterior, outstretched

Bast, Bastian
Bütsch, Bütschli
Clap, Claparède
Dies, Diesing
Ditlev, Ditlevsen
Duf, Dufour
Duj, Dujardin
Ehrenb, Ehrenberg
Fil, Filipjev
Leuck, Leuckart
Linst, von Linstow
Metsch, Metschnikoff
Micol, Micoletzky
Strass, zur Strassen

GLOSSARY

adhesion tubes, hollow tube-like setae by means of which some nemas "walk" along a surface
ambulatory setae, setae, sometimes hollow and tube-like, by means of which some nemas "walk" along a surface
amphid, a paired lateral sense organ the opening of which is often conspicuous, near the anterior end
amphidial opening, the pore (or larger aperture) through the cuticle at which amphid opens exteriorly
amphidial pocket, a chamber, outline often cup-shaped, sometimes present just behind external amphid
ampulla, widening in canal, forming a reservoir
annulated, having annules
annules, definite transverse rings of the cuticle
apophysate, having an apophysis
appendicule, a large single ventral pre-anal supplementary organ which is extensible
bursa, flap-like extensions of the lateral cuticle of the tail end of the male
calvarium, subcuticular cephalic framework
cardiac bulb, swelling of oesophageal wall, glandular or muscular, just anterior to beginning of intestine
cardiac valve, thickening or complication of oesophageal lining in cardiac bulb, functioning as a valve
caudal glands, 3 cells in or near tail, emptying by separate ducts into a common ampulla at spinneret
cephalated, having the head or anterior end set off in some way
cephalic setae, setae of the second or "outer" circlet around the mouth
cephaloboid, resembling (that of) the genus *Cephalobus*
cervical, on the neck
chromadoroid, resembling (that of) the genus *Chromadora*
cirri, elaborate cephalic appendages in front of the cephalic setae
cuirasse, a helmet-like appearance of cuticle of head
cyatholaimoid, resembling (that of) the genus *Cyatholaimus*
demanian system, gonenteric system of vessels connecting intestine and uteri with each other, and posteriorly with the exterior
dentate, bearing teeth
denticles, minute teeth or "prickles," usually numerous
denticulate, bearing denticles
diplogastroid, resembling (that of) the genus *Diplogaster*
dorylaimoid, resembling (that of) the genus *Dorylaimus*
enchelid, male form such as has been classified in the genus *Enchelidium*, male of *Symplocostoma* group
eurystomoid, resembling (that of) the genus *Eurystomina*
excretory duct, canal leading from renette to ampulla near excretory pore
excretory pore, opening through cuticle (usually cervical or cephalic), at which the renette empties
external amphid, the cuticular manifestation of the amphid
glottoid apparatus, valvular structure at base of pharynx
gubernaculum, grooved cuticularized piece, sometimes paired, through which the spicula slide
head, portion of nema anterior to base of mouth cavity
jaws, cuticular framework around the mouth, for grasping and holding; fundamentally 3-parted
labial setae, setae of the "inner" circlet, on the lips or close to the mouth
male supplements, male organs, usually pre- or post-anal, usually a single ventral row, or paired, subventral
mandibles, hard, strong, biting or grasping organs around the mouth
mandibular, of the mandibles, resembling mandibles
median bulb, swelling of the oesophageal wall at or near the middle of its length
monospiral, spiral of one wind or not much more
monospire, spiral, or a spiral, of one wind or not much more
mucron, a knob-like ending, shaped like that on the end of a lemon
multispiral, spiral of two or more winds
multispire, spiral, or a spiral, of two or more winds
neck, portion of nema anterior to base of oesophagus
odontium (odontia), labial tooth (teeth)
oesophagus, portion of alimentary tract between pharynx and intestine, sometimes surrounding pharynx
onchium (onchia), pharyngeal tooth (teeth)
"palps," special labial appendages, apparently for touching, grasping, or getting material to mouth
percent, percent of body length, or distant from anterior end measured in percent of body length
pharyngeal bulb, muscular swelling of the oesophageal wall around the pharynx
pharynx, the mouth cavity and its walls
phasmids, a pair of cuticular pores on the tail
plectoid, resembling (that of) the genus *Plectus*
posterior bulb, cardiac bulb, q.v.
probolae, prominent and elaborate specialized appendages encircling the mouth
pseudonchs, structures in pharynx which from some points of view resemble onchia
renette, a cell or group of cells emptying through the excretory duct(s)
rhabditoid, resembling (that of) the genus *Rhabditis*
sensory papilla, a structure in the amphidial area in which apparently nerves terminate
setae, hair-like structures on the cuticle
sole, the region of attachment of the special ambulatory setae or adhesion tubes
somatic setae, setae general on the surface of the body (opposed to cephalic, caudal, etc. setae)
spear, a long, rather slender onchium, in adult usually axial
spicula, male intromittent organs, often paired each an elongate cuticularized framework, extrusible through anus
spinneret, outlet, usually terminal, of the caudal glands, enabling nema to attach itself
striae, fine transverse lines in the cuticle
striate(d), showing striae
stylet, a long slender spear
subcephalic setae, setae on the head but behind the cephalic circlet
supplementary organs, see male supplements
tooth, element of buccal armature,—onchium, odontium, spear etc.
tylenchoid, resembling (that of) the genus *Tylenchus*
uvette, rosette or group of cells between uterine afferent duct and efferent duct of demanian system
vestibule, entrance to the mouth cavity, sometimes a distinct chamber
wings, longitudinal structures in cuticle, or projecting from it, usually lateral, but sometimes numerous and evenly spaced around the nema

KEY

PHARYNX ABSENT, or so obscure as easily to escape notice (for alternative see page 8)

Oesophagus with median or posterior bulb or swelling, or both (for alternative see next page)
Amphid not known or obscure
Female known; wings 0
Ovary 1, anterior; ceph. set. 0; oesoph. with med. bulb; spinneret 0; bursa pres.; in soil..*Iotonchium* Cobb 1920 (=*Hemicycliophora* de Man 1921)

Ovaries 2, reflexed
Spinneret none; amphid a pore at lips; cepn. set. 2, minute; in beetle larvae....(*Neoaplectana* Steiner 1929)
Spinneret present; oesoph. without median bulb; bursa none; marine
Cephalic setae 0; cuticle not annulated; spicula long, 18%, flexible.....*Molgolaimus* Ditlev. 1921
Cephalic setae numerous, in circlets of 4; cuticle annulated, exc. on head.....(*Stilbonema* Cobb 1920)
Female not known
Hemispherical cephalic cap suddenly wider than neck, edge set with dots.....*Mitrephorus* Linst. 1877
Hemispherical cephalic cap absent
Spinneret absent; cephalic setae 0; wings present; in soil; J.....*Litonema* Cobb 1920
Spinneret present (Nuadella ?); ceph. set. present; wings 0, striae uninterrupted; marine
Cuticle not annulated, striae none; cephalic setae small
Neck 8%; cardiac swelling slight, clavate.....*Nuadella* Allgen 1927
Neck under 4%; card. bulb broad; ceph. set. in 3 circlets of 4; amph. small, near lips..(*Catanema* Cobb 1920)
Cuticle annulated, exc. on head; amphid near lips
Setae on head, labial 6, ceph. 10; contour of nema ± serrate; pores lateral.....(*Leptonemella* Cobb 1920)
Setae on head in circlets of 4; contour of nema crenate; pores 0; nema 10 mm.....(*Laxonema* Cobb 1920)

Amphid known
External amphid not spiral, circular nor elliptical
Head a hemispherical cap, suddenly wider than neck, edge set with dots.....*Mitrephorus* Linst. 1877
Head not suddenly wider nor cap-like
Habitat soil about roots
Spinneret present; lips 6, long, revolute, flower-like; amph. semicircular; wings 2; '♀' *Anthonema* Cobb 1906
Spinneret absent; lips not long nor revolute; cephalic setae 0
Wings pres. oesoph. ±cephaloboid;striae ±coarse;amph. transverse,½ head-width; '♀*Iotalaimus* Cobb 1920
Wings absent, striae not interrupted
Ceph. papill.6, conspic.;amph.crescentic,head-width back;tail 3%, rounded; ♂ only *Bolbinium* Cobb 1920
Ceph. papill. tiny; amph. inconspic.,2 head-widths back;tail 6–12%, slender,conoid *Alaimus* de Man 1880
Habitat marine; cephalic setae and spinneret present
Ambulatory & body setae absent; nema not crooked
Wings pres.; amph. shepherd's crook; annules under 300, of tile-like elements; '♀' *Ceramonema* Cobb 1920 (cf. *Pselionema* Cobb 1933)
Wings 0; amph. a tranverse slit, at lips; pores lateral; nema ±2 mm.; ♂ only...*Leptonemella* Cobb 1920
Ambulatory & body setae pres.; amph. crook-shape to spiral; nema ±S-shaped; '♀'
Oesoph. region hardly swollen; card. bulb faint; cerv. striae alike.....*Notochaetosoma* Irwin-Smith 1918
Oesoph. region swollen, ovoid; oesophageal bulbs 1 or 2; band of cervical striae accentuated, exc. Tristicochaeta falcatum
Ventral ambulatory adhesion tubes or setae in 3 or 4 rows.....*Tristicochaeta* Panceri 1878 (=*Draconema* Cobb 1913)
Ventral ambulatory adhesion tubes or setae in 2 rows.....*Drepanonema* Cobb 1933 (=*Chaetosoma* Clap. 1863)
External amphid spiral, circular or elliptical
Female not known; J only, exc. Bolbinium
Annules ±90, prominent; subdorsal setae 9 prs.; amph. saccate; nema 10%+ wide *Eudesmoscolex* Steiner 1916
Annules 0 or not prominent; subdorsal setae 0; amphid not saccate; nema under 5% wide
Spinneret absent; cephalic setae 0; in soil
Cephalic papillae 6, conspicuous, each on circular base.....*Bolbinium* Cobb 1920
Cephalic papillae 0 or inconspicuous; wings double; oesophagus ±cephaloboid.....*Litonema* Cobb 1920
Spinneret present
Wings single, projecting; amphid almost neck width, barely longer than broad.....*Antomicron* Cobb 1920
Wings 0, striae not interrupted laterally
Pharynx with basal cuticularized ring; amphid monospire.....(*Cricolaimus* Southern 1914)
Pharynx without basal cuticularized ring; cephalic setae in circlets of 4
Amphid spiral, of 2 winds.....(*Alaimonema* Cobb 1920)
Amphid circular or elliptical
Head set off by constriction, spherical; cephalic setae 4; amphid on neck.....*Cinctonema* Cobb 1920
Head set off by lack of annules, if at all; ceph. set. many; amph. small, at lips; neck 2%
Cuticle without annules; head not set off; pharnyx definite; nema 3–4 mm.....(*Catanema* Cobb 1920)
Cuticle with annules exc. on head; pharnyx obscure; nema 10 mm.....*Lazonema* Cobb 1920
Female known
Ovary 1; spinneret none; wings 0; cephalic setae 0 or papilloid
Gonad ♀ posterior, reflexed; amphid ±obscure; cardiac swelling slight; in soil.....(*Alaimus* de Man 1880)
Gonad ♀ anterior, outstretched
Habitat marine; anterior oesophagus fusiform, cardiac bulb massive.....(*Solenolaimus* Cobb 1894)
Habitat soil; oesophagus with median bulb; bursa present.....*Iotonchium* Cobb 1920 (=*Hemicycliophora* de Man 1921)
Ovaries 2
Gonads ♀ outstretched; cephalic setae present; marine (for alternative see next page)
Spinneret doubtful or absent; striae very fine or seen with difficulty
Cephalic setae 10, subcephalic 4; amphid multispire.....(*Laimella* Cobb 1920)
Cephalic setae 4 or 8; amphid circular
Pharynx none; cardiac bulb broad, valvate; tail setaceous.....*Terschellingia* de Man 1888
Pharynx obconoid; cardiac bulb pyriform, sometimes valvate.....(*Cryptolaimus* Cobb 1933)
Spinneret present
Length of oval monospiral amphid twice its width, equalling head width.....*Disconema Fil.* 1918
Length of amphid not much greater than its width
Gland ducts cuticularized, pores ventrad, cerv. & pre-anal; striae coarse *Halaphanolaimus* Southern 1914
Gland ducts and pores 0; striae fine, usually plain

Oesophagus narrowed from middle; cephalic setae 4; amphid large; head narrowed *Cyartonema Cobb* 1920
Oesophagus not narrowed; cephalic setae present; wings 0
Setae on head 10, 4 short specialized at tip; cardiac swelling slight.....(*Linhomoella* Cobb 1920)
Setae on head 4–8, less than 1 head-width long, tip not specialized; amphid circular
Pharynx 0; nema small, tapered; card. bulb broad, valvate; tail setaceous..*Terschellingia* de Man 1888
Pharynx present though obscure
Ceph. set. 8–10; card. swelling none or clavate, non-valvate; nema not tapered *Linhomoeus* Bast. 1865
Ceph. set. 4; cardiac bulb pyriform, sometimes valvate; pharynx obconoid (*Cryptolaimus* Cobb 1933)
Gonads ♀ reflexed; amphid circular, oval or monospiral (for alternative see preceding page)
Spinneret none; amphid a pore at lips; ceph. set. 2, minute; in beetle larvae...(*Neoaplectana* Steiner 1929)
Spinneret present; marine exc. Haliplectus
Ambulatory setae 0; nema not crooked; calvarium absent, or not truncate-conoid
Med. oes. bulb pres.; ceph. set. 0; pores in submed. rows; water & brackish soil..(*Haliplectus* Cobb 1913)
Med. oes. bulb absent; marine
Gland ducts cuticularized, pores cerv. & pre-anal; striae coarse...(*Halaphanolaimus* Southern 1914)
Gland ducts and pores none or not cuticularized
Head expanded opposite monospiral amphid; cephalic setae 4.....*Bolbonema* Cobb 1920
Head not expanded
Cephalic setae 0; wings 0; head narrowed from amphid forward.....*Aegialoalaimus* de Man 1907
Cephalic setae present; often in coastal sand
Amphid oval, 1 head-width long; annules fine; wing single; ceph. set. 4..*Eutelolaimus* de Man 1922
Amphid ±equidiametral, less than ½ corresponding neck width
Neck 21%; striae duplex; wings 2; ceph. setae 4; pharynx narrow, inconspicuous *Aplectus* Cobb 1914
Neck 7% or less; striae not duplex; wings 0
Cuticle annulated; amph. small, at lips; set. on head many, in circles of 4..(*Stilbonema* Cobb 1920)
Cuticle finely striated; amphid ¼ to ½ head-width, often monospiral
Pharynx straight,closed,with pharyng.swelling; nema 4–7 mm.; width 0.3–0.8% *Laxus* Cobb 1894
Pharynx conoid, often with small onchium; nema 2–4 mm.; width 1.5–3.5% *Spirina* Fil. 1918
(=*Spira* Bast. 1865)
Ambulatory set. forming a ventral sole, midbody or pre-anal; nema crooked; calvarium unstriated
Nema narrowest in cardiac region, ±S-shaped; ambulatory setae hollow, pre-anal; annules finer
Oesoph. region hardly swollen; card. bulb faint; cervical striae alike...*Notochaetosoma* Irwin-Smith 1918
Oesoph. region swollen, ovoid; oesophageal bulbs 1 or 2; band of cervical striae accentuated, exc. Tristicochaeta falcatum
Ventral ambulatory adhesion tubes or setae in 3 or 4 rows.....*Tristicochaeta* Panceri 1878
(=*Dreconema* Cobb 1913)
Ventral ambulatory adhesion tubes or setae in 2 rows.....*Drepanonema* Cobb 1933
(=*Chaetosoma* Clap. 1863)
Nema narrowest midway, epsilon-shaped; ambulatory setae not open at end; annules coarser
Sole apparently absent; amphid crescentic; annules 98.....*Epsilonella* Steiner 1930
Sole present; amphid circular or monospiral
Oesophagus with median and cardiac bulbs.....*Metepsilonema* Steiner 1927
Oesophagus with cardiac bulb only
Annules 80–112; ambulatory setae slender, falcate.....*Bathyepsilonema* Steiner 1927
Annules 144–192; ambulatory setae straight or slightly arcuate
Body cylindroid, if crooked faintly so.....*Archepsilonema* Steiner 1927
Body epsilon-like, i.e. body arches well developed
Cuticular annules homogeneous in structure.....*Prochaetosoma* Baylis & Daubney 1926
(=*Rhabdogaster* Metsch. 1867)
Cuticular annules not homogeneous in structure
"Axial" part of the cuticular annules hollow ("frame rings").....*Epsilonema* Steiner 1927
"Axial" part of the cuticular annules vacuolated, etc.....*Epsilonoides* Steiner 1931

Oesophagus plain, i.e. without median or posterior bulb or swelling (for alternative see preceding page)
Amphid not known or obscure (for alternative see next page)
Female not known
Habitat freshwater marshes; setae 0; spinneret none; neck 15–25%; wings double *Macroposthonia* de Man 1880
Habitat marine
Neck 8%, cylindroid; cephalic setae 4(?); tail cylindroid.....*Nuadella* Allgen 1927
Neck 16–43%, ±tapering; tail conoid
Spinneret absent; eyes 0; neck ±40%; cephalic setae 4 or 8.....(*Halalaimoides* Cobb 1933)
Spinneret present; eyes with lenses; neck 16–25%
Cephalic setae 4; head set off by cessation of very fine striation.....*Nemella* Cobb 1920
Cephalic setae 10; striae none; amphid and setae very large; adult ♂ only.....*Enchelidium* Ehrenb. 1836
(=*Lasiomitus* Marion 1870
=*Parasymplocostoma* Schulz 1932)
Female known
Ovary 1, anterior exc. Antopus & Thalassoalaimus (for alternative see next page)
Gonad ♀ outstretched; setae 4, papilloid; amphid minute, open caudad; marine algae...(*Litotes* Cobb 1920)
Gonad ♀ reflexed; spinneret none, exc. Antopus & Thalassoalaimus
Cephalic setae 6; posterior ovary longer than anterior; marine
Pores in dorso-lateral rows.....*Antopus* Cobb 1933
Pores none.....*Thalassoalaimus* de Man 1893
Cephalic setae 0; vulva near anus; spicula 2; in and around insects
Spear none or vestigial
Uterus not evaginated
Nema serpentine; oesophagus and intestine persisting; in beetles and weevils...*Bradynema* Strass. 1892
Nema saccate; organs degenerating exc. gonads.....*Allantonema* Leuck. 1884
(=*Tylenchomorphus* Fuchs 1914)
Uterus finally evaginated; oesophagus and intestine degenerating early
Evaginated uterus many times as large as nema.....*Sphaerularia* Duf. 1837
Evaginated uterus not much larger than nema.....*Asconema* Leuck. 1886
(=*Atractonema* Leuck. 1887)
Spear present, at least in larva or ♀; organs degenerating in adult
Base of spear ±bulbed; oes. fusiform, glands abs. in ♂; bursa pre- and post-anal..*Scatonema* Bovien 1932
Base of spear straight; spicula nearly straight
Vulva degenerating; ♀ free living; bursa pre-anal; in Passalus..*Chondronema* Christie & Chitwood 1931
(=*Uracanthus* Dies. 1861)

Vulva remaining functional; adult ♀ parasitic; gubernaculum small
Anus none or vestigial; in cucumber beetle, Diabrotica.....*Howardula* Cobb 1921
Anus persisting; in frit-fly, Oscinella.....(*Tylenchinema* Goodey 1930)
Ovaries 2; spinneret present exc. Micoletzkyia (for alternative see preceding page)
Gonads ♀ parallel, posterior; wings 10–12, segmenting the annules.....*Porocoma* Cobb 1920
Gonads ♀ opposed
The ovaries outstretched; marine
Annules few, very coarse; amphid saccate; cephalic setae 4; nema wide
Number of annules ±17, secreted annules prominent, separated; head small....*Desmoscolex* Clap. 1863
Number of annules 32–91, secreted annules absent; head concave-quadrate pyramidal..*Tricoma* Cobb 1894
(=*Quadricoma* Fil. 1922)
Annules and striae 0; amphid not saccate; cuticle thick.....*Phanodermella* Kreis 1928
The ovaries reflexed
Habitat freshwater; lips 3, thick; pharynx narrow, deep; onchium minute, deepset (*Tripyla* Bast. 1865)
(=*Promononchus* Micol. 1923)
Habitat marine; pharnyx and onchium absent
Annules ±17,secreted annules prominent;amphid saccate;ceph. set. 4;nema wide *Desmoscolex* Clap. 1863
Annules not few nor coarse; amphid not saccate; nema ±slender
Odontia 6; lip region discoid; ceph. set. 4; gland ducts oft piercing cuticle..*Stephanolaimus* Ditlev. 1918
Odontia 0; lip region not set off
Head set off by constrict.; ceph. set. 8; spicula long, slender; gub. complex *Micoletzkyia* Ditlev. 1926
Head not set off; cephalic setae 4 or 6
Setae on head 4; eyes with lenses; amphid transverse-oval, at lips; among algae....(*Ionema* Cobb 1920)
Setae on head 6; eyes none
Spicula short, 1 anal body-diam.; pores 0; longest cerv. set. ½ neck-width..*Parozystomina* Micol. 1924
Spicula long, several anal body-diameters
Cervical setae in 6 longitudinal rows; pores 0; ovaries equally long.....(*Stenolaimus* Marion 1870)
Cervical setae 0; pores in dorso-sublat. rows; ovary post., anterior a rudiment..*Antopus* Cobb 1933

Amphid known (for alternative see preceding page)
External amphid not spiral, circular nor elliptical (for alternative see next page)
Female not known; marine
Neck ±40%;amph. narrow, several head-widths long;tail setaceous;spinneret oft 0 *Halalaimoides* Cobb 1933
Neck not over 25%; amphid not linear; spinneret present
Wings absent
Odontia 6;lip papill. 6;ceph. set. 10(?); subceph. 4, jointed; amph. oval, flat caudad *Apodontium* Cobb 1920
Odontia 0; mouth & phar. vestigial; eyes, amph. & set. very large; adult ♂ only *Enchelidium* Ehrenb. 1836
(=*Lasiomitus* Marion 1870
=*Parasymplocostoma* Schulz 1932)
Wings conspicuous
Head mitreform, set off by constriction; striae 0; cephalic setae small, 4 or 6.....*Xennella* Cobb 1920
Head not mitreform, set off by lack of annulation; annules of "tiles"; amph. crook-shape
Annules over 700; ceph. set. conspicuous, 8, in 2 circlets; onchia 0; nema 3 mm.+ *Pristionema* Cobb 1933
Annules under 300; cephalic setae 4; onchium present (?); nema under 1 mm.....*Pselionema* Cobb 1933
(=*Steineria* Fil. 1922)
(cf. *Ceramonema* Cobb 1920)
Female known
Ovary 1
Gonad ♀ outstretched, anterior;ceph. papill. 4;amph. minute, open caudad;marine algae *Litotes* Cobb 1920
Gonad ♀ reflexed
Spinneret present; ovary posterior, anterior branch short; wings 0; marine *Thalassoalaimus* de Man 1893
Spinneret absent; ovary anterior; in soil about roots
Wings present, striae ±coarse; cephalic papillae 4; amphid 1 head-width back...*Iotalaimus* Cobb 1920
Wings 0, striae 0; cephalic papillae minute; amphid 2 head-widths back.....*Alaimus* de Man 1880
Ovaries 2
Gonads ♀ outstretched; spinneret present; marine
Annules ±17, secreted annules prominent;amphid saccate;ceph. setae 4;nema wide *Desmoscolex* Clap. 1863
Annules not few nor coarse; amphid not saccate; nema ±slender
Mouth ventrad; amphid huge, bent, dorsal limb the longer.....*Campylaimus* Cobb 1920
Mouth axial; amphid not huge
Amphid narrow, oft many head-widths long; eyes 0; cephalic setae 6, subceph. 4 *Halalaimus* de Man 1888
Amphid "folded," not over 1 head-width long; eyes 2, sometimes absent
Oesophagus and lumen widened between eyes and nerve ring; pharynx obvious (*Coinonema* Cobb 1920)
Oesophagus and lumen not widened; pharynx like oesoph. lining....*Araeolaimoides* (de Man) Fil. 1918
Gonads ♀ reflexed
Spinneret 0; tail 3%; ceph. set. 10, cervical long, 1 group at amphid; marine..*Platycomopsis* Ditlev. 1926
(=*Dactylonema* Fil. 1927)
Spinneret present
Habitat freshwater; lips 3, thick; pharynx narrow, deep; onchium minute, deepset (*Tripyla* Bast. 1865)
(=*Promononchus* Micol. 1923)
Habitat marine; onchia absent exc. Actinonema
Amphid narrow, several head-widths long; head set off, with colorless cuticle
Cephalic & subceph. setae ±1 head-width apart; cuticle thin (to $\frac{1}{12}$ radius)...*Halalaimus* de Man 1888
Cephalic & subceph. setae near together exc. Nuada isaitshikovi; cuticle thick, ⅛ to ½ radius
The cuticle ⅛ to ¼ radius in thickness.....*Nuada* Southern 1914
The cuticle ¼ to ½ radius in thickness.....*Tycnodora* Cobb 1920
Amphid not narrow nor very long
Shape of amphid a shepherd's crook; each annule of tile-like elements.....*Ceramonema* Cobb 1920
(cf. *Pselionema* Cobb 1933)
Shape of amphid not a shepherd's crook; annules not of tile-like elements
Annules ±17, secreted annules prominent;amph. saccate; ceph.set.4; nema wide *Desmoscolex* Clap. 1863
Annules not few nor coarse; amphid not saccate; nema ±slender
Cuticle ¼ radius; striae coarse; amphid transverse, ⅛ head-width; setae 0....(*Actinonema* Cobb 1920)
Cuticle not thick; amphid not a transverse slit; eyes with lenses; cephalic setae 4
Amphidial gland large, conspicuous; cephalic setae 4, ½ head-width long.....*Ionema* Cobb 1920
Amphidial gland not evident; external amph. ±semicircular, internal elongate *Nemella* Cobb 1920

External amphid spiral, circular or elliptical (for alternative see preceding page)
Female not known; spinneret present
Habitat brackish earth; wings faint; ♂ supplements on neck, ventral, papilloid *Deontolaimus* de Man 1880
Habitat marine
Annules ±90, prominent;subdorsal setae 9 prs.;amph. saccate; nema 10% + wide *Eudesmoscolex* Steiner 1916
Annules none or not prominent; subdorsal setae 0; amphid not saccate; nema under 5% wide
Wing small, distinct; amphid almost neck width, joined dorsad.....(*Antomicron* Cobb 1920)
Wings absent
Mouth and digestive system vestigial; setae strongly developed
Eyes absent.....*Barbonema* Fil. 1927
Eyes and amphid strongly developed; adult ♂ only.....(*Enchelidium* Ehrenb. 1836)
(=*Lasiomitus* Marion 1870
=*Parasymplocostoma* Schulz 1932)
Mouth and digestive system functional
Odontia 6, minute; cephalic setae 10(?), subcephalic 4, jointed.....*Apodontium* Cobb 1920
Odontia 0; cephalic setae 0 or rather small
Annules rather coarse; setae minute; amphid transverse-oval.....(*Zygonemella* Cobb 1920)
Annules and striae none; amphid with internal pocket
Cephalic setae 0; amphid long-oval, internal pocket conspicuous.....*Schistodera* Cobb 1920
Cephalic setae small, 10; cervical setae lateral; amphid small, round.....(*Leptosomatides* Fil. 1918)
Female known
Ovary 1; amphid not multispire
Gonad ♀ outstretched
The ovary posterior; spinneret present
Amphid large, open caudad; spinneret sometimes doubtful; marine.....(*Alaimella* Cobb 1920)
Amphid round; anterior ovary rudimentary; ceph. set. 12, in 2 circlets; in salt marsh *Litinium* Cobb 1920
The ovary anterior; marine
Pharynx absent; setae 4, papilloid; amph. small, open caudad; spinneret 0; among algae *Litotes* Cobb 1920
Pharynx present, often minute; setae not papilloid; amphid larger, circular; spinneret sometimes 0
Onchia 0; nema small.....*Monhystera* Bast. 1865
(=*Tachyhodites* Bast. 1865)
Onchium dorsal; nema often several millimetres long.....*Linhomoeus* Bast. 1865
(=*L. obtusicaudatus* de Man 1907)
Gonad ♀ reflexed
Habitat soil or fresh water, or in insects; amphid circular
The ovary posterior; spinneret absent; in marshy soil.....*Alaimus* de Man 1880
The ovary anterior
Spinneret present; in fresh water.....*Helalaimus* de Cillis 1917
Spinneret absent; in beetle, Passalus.....*Chondronema* Christie & Chitwood 1931
(=*Uracanthus* Dies. 1861)
Habitat marine; ovary posterior; spinneret present (Alaimella ?)
Cephalic setae 0
Amphid monospire; in sand about algae.....*Nemanema* Cobb 1920
Amphid long-oval, with posterior cuticularized pocket.....*Schistodera* Cobb 1920
(cf. *Oxystomina* Fil. 1921)
Cephalic setae present
Setae on head 4, over 1 head-width long; striae coarse; amphid large, open caudad..*Alaimella* Cobb 1920
Setae 10 or 16, 4 being subcephalic; striae 0 or fine
External amphid circular; cephalic setae 12, as long as head is wide.....*Litinium* Cobb 1920
External amphid oval, pocket cuticularized; cephalic setae 6 (4?)
Amphidial opening small transverse-oval, or circular.....*Nemanemella* Fil. 1927
Amphidial opening large, long-oval.....*Oxystomina* Fil. 1921
(=*Oxystoma* Bütsch. 1874)
Ovaries 2
Gonads ♀ outstretched; marine
Spinneret absent
Pharyngeal bulb definite; ceph. setae 6, stout, jointed; amphid circular; in sand (*Cytolaimium* Cobb 1920)
Pharyngeal bulb absent
Tail 3%, conoid; ceph. set. 10; cervical long, bunched; amphid transverse-oval.....*Platycoma* Cobb 1894
Tail over 12%, conoid then cylindroid; ceph. set. minute, 18, in 3 circlets.....(*Anticyathus* Cobb 1920)
Spinneret present
Gland ducts cuticularized, pores cervical & pre-anal; striae coarse.....(*Halaphanolaimus* Southern 1914)
Gland ducts and pores absent
Annules few, very coarse; amphid saccate; cephalic setae 4; nema wide
Number of annules ±17, secreted annules prominent, separated; head small...*Desmoscolex* Clap. 1863
Number of annules 32–91, secreted annules none; head concave-quadrate pyramidal *Tricoma* Cobb 1894
(=*Quadricoma* Fil. 1922)
Annules if present not coarse; amphid not saccate
Amphid multispire
Cephalic setae 10, shorter 4 specialized at tips; multispire faint; neck 5%.....*Linhomoella* Cobb 1920
Cephalic setae without specialized tips; multispire distinct; neck 9–16%
Male ventral pre-anal supplementary organs papilloid.....*Parasabatieria* de Man 1907
Male ventral pre-anal supplementary organs absent.....*Sabatieria* de Rouville 1903
Amphid circular (Southernia slightly irregular)
Oesoph. & lumen with ellipsoid enlargement behind eyes; eyes sometimes 0 *Araeolaimus* de Man 1888
Oesoph. without median enlargement; eyes 0
Cephalic setae 4; amphid slightly irregular.....*Southernia* Allgen 1929
Cephalic setae 6–10
Lips distinct; pharyngeal bulb pres.; ceph. set. 6, stout, jointed; papillae 6..*Cytolaimium* Cobb 1920
Lips 0 or confluent
Setae on head 10, shorter 4 specialized at tips; multispire faint.....(*Linhomoella* Cobb 1920)
Setae on head without specialized tips; amphid circular.....*Linhomoeus* Bast. 1865
Gonads ♀ reflexed
Spinneret absent; amphid circular, elliptical or monospiral; wings 0 (for alternative see next page)
Habitat soil; internal amphid ±conspicuous.....(*Bastiania* de Man 1876)
Habitat marine
Tail 40%; vulva 33%; ceph. set. 6, subceph. 6; internal amphid ±conspicuous....*Trefusia* de Man 1893

Tail under 10%; vulva ±60%; ceph. set. ±1 head-width long; internal amphid not conspicuous
Ceph. set 10, cervical long, bunched, in ♂ 2 flat ones at amphid; tail 3%, conoid..*Platycoma* Cobb 1894
Ceph. set. 4 (6?), other setae 0; nema cephalated by contraction; tail slender, 9%...*Acoma* Steiner 1916
Spinneret present (for alternative see preceding page)
Habitat not marine (Aphanolaimus ?); contour often crenate
Amphid obscure,small;pharynx narrow;onch.deepset;ceph.set.6–10,oft papilloid...(*Tripyla* Bast. 1865)
(=*Promononchus* Micol. 1923)
Amphid distinct, circular or spiral; pharynx none or closed; ceph. set. 6, rarely 4 or 0
Position of amphid ½–2 head-widths back.....*Aphanolaimus* de Man 1880
Position of amphid 3–4 head-widths back.....*Bastiania* de Man 1876
Habitat marine
Ambulatory tubes hollow; body setose, annulated
The amphid not saccate; ambulatory tubes ventral; setae not dense..*Notochaetosoma* Irwin-Smith 1918
The amphid saccate; annules coarse, 17–91; nema broad
Body setae not dense; secondary annules secreted, prominent.....(*Desmoscolex* Clap. 1863)
Body setae dense, set along annules; junction oesoph. & intestine indefinite....(*Greeffiella* Cobb 1922)
(=*Trichoderma* Greeff 1869)
Ambulatory tubes absent; body not densely setose; not annulated exc. Stephanolaimus
Wings ±50;nema broad,±16%;neck "collared";amphid spiral;pharynx small...*Richtersia* Steiner 1916
Wings if present not numerous; nema slender, under 5%
Odontia 6; ceph. set. 4, long; lip reg. discoid; gland ducts oft projecting..*Stephanolaimus* Ditlev. 1918
Odontia 0; cephalic setae not longer than head is wide
Gland ducts cuticularized, pores cervical & pre-anal; striae coarse..*Halaphanolaimus* Southern 1914
Gland ducts and pores none, or not cuticularized
The amphid multispire; cephalic setae 16, ±1 head-width long; in sand..*Nannolaimus* Cobb 1920
The amphid not multispire
Amphid at lips, transverse-oval, with large gland; eyes with lenses.....*Ionema* Cobb 1920
Amphid not at lips; eyes none exc. Leptosomatum
Anterior part of oesoph. the wider; cervical setae 0; amphid ±irregular...*Southernia* Allgen 1929
Anterior part of oesoph. not wider; amphid with internal pocket
Oesophagus crenate posteriorly
Calvarium none; labial tubercles none.....*Stenolaimus* Marion 1870
Calvarium in front of ceph. set., margin irregular; labial tubercles 3.....*Klugea* Fil. 1927
(=*Phanodermopsis* Ditlev. 1926, in part)
Oesophagus not crenate posteriorly
Cephalic setae 0; pores on anterior half of neck; tail rounded.....*Leptosomatum* Bast. 1865
Cephalic setae present; pores on neck absent
Setae on neck none; cephalic setae 10, ±1 head-width long.....*Leptosomella* Fil. 1927
Setae on neck in lateral series; amphid small
Gubernaculum present; ♂ pre-anal ventral supplement tubular.....*Anticoma* Bast. 1865
Gubernaculum none; ♂ pre-anal ventral supplement papilloid...(*Anticomopsis* Micol. 1930)

PHARYNX PRESENT (for alternative see page 4)

Wall of the Pharynx armed (for alternative see page 20)
Armature spear-like or apparently so (for alternative see page 11)
Spear bulbed; cephalic setae usually 0; amph. oft obscure; spinneret 0; not marine exc. Siphonolaimus (pg. 10)
Oesophagus plain, i.e. without median or posterior bulb or swelling; cephalic setae 0
Female not known;spear with retrorse points midway,base 3-lobed;bursa lobed..*Ecphyadophora* de Man 1921
Female known; ovary 1
Gonad ♀ reflexed
Habit free-living; spear (dorso-ventral view) arrow-headed; ovary posterior..*Pharetrolaimus* de Man 1921
Habit parasitic in beetles, etc.; ovary anterior
Nema saccate; mouth none, organs degenerated; vulva terminal.....(*Allantonema* Leuck. 1884)
(=*Tylenchomorphus* Fuchs 1914)
Nema not saccate; anus none or vestigial
Spear none; parasitic in beetles, weevils, etc.....(*Bradynema* Strass. 1892)
Spear present in young ♀ only; in cucumber beetle, Diabrotica.....*Howardula* Cobb 1921
Gonad ♀ outstretched; mostly parasitic
Anus none or vestigial; spear ±vestigial; in cucumber beetle, Diabrotica.....(*Howardula* Cobb 1921)
Anus present; spear present, in Aphelenchulus reduced; traces median bulb sometimes present
Junction oesoph. & intest. definite; anterior oes. fusiform, isthmus at nerve ring; in or about plants
Habitat crop plants; head of 8 sectors; terminus of tail straight.....*Neotylenchus* Steiner 1931
Habitat bladders of Fucus, or among marine algae; head of 6 sectors; tail hooked..*Halenchus* Cobb 1933
Junction oesophagus and intestine indefinite
Spear with 6 basal lobes; oesoph. isthmus at nerve ring; in decaying vegetation..*Hexatylus* Goodey 1926
Spear with tripartite base; renette ±body length; parasitic in insects.....*Aphelenchulus* Cobb 1920
Oesophagus with median or posterior bulb or swelling, or both
Female not known; spear tripartite at base
Cephalic setae 4, ±1 head-width long; oesoph. swellings med. & card.; bursa striate..*Eutylenchus* Cobb 1913
Cephalic setae 0 or papilloid
Spear with retrorse points midway, 3-lobed at base; bursa small, lobed.....*Ecphyadophora* de Man 1921
Spear without retrorse points midway; oesophagus without median bulb
Pharyngeal bulb 0,cardiac ⅓ neck length;ceph.set.0;nema 5% wide;bursa 0..*Tylencholaimellus* Cobb 1915
Pharyngeal bulb pres.;ceph.set.6,papilloid;nema 9% wide;tail short,rounded..*Brachynemella* Cobb 1933
(=*Brachynema* Cobb 1893)
Female known
Ovaries 2; cephalic setae 0; spear with tripartite base (for alternative see next page)
Gonads ♀ outstretched (for alternative see next page)
Median oesophageal bulb absent; spear 3-pronged at base; in sandy soil...(*Tylolaimophorus* de Man 1880)
Median oesophageal bulb present; spear 3-lobed at base
Junction oesoph.& intestine indefinite;annules plain;tail rounded,with bursa..*Hoplolaimus* Daday 1905
Junction oesoph. & intestine definite, exc. sometimes Tylenchus
Spear-guide wide as head, forming cuirasse or helmet; bursa none; testes 2..*Nemonchus* Cobb 1913

Spear-guide smaller, slighter, not forming cuirasse; bursa present
Nema cephalated by constriction, head ±discoid; spear long; bursa lobate....*Dolichodorus* Cobb 1914
Nema cephalated by contraction or not at all; bursa not lobate
Anterior end extensible,narrow & beak-like,inner framework cuticular..*Tylenchorhynchus* Cobb 1913
Anterior end never narrowed & beak-like, without cuticular framework.....*Tylenchus* Bast. 1865
Gonads ♀ reflexed (for alternative see preceding page)
Structure of pharynx obscure; oesophagus with cardiac swelling only
"Spear" 3 rods, ant. hinged to 2 U-shaped pieces, post. 2 stalked swellings..(*Tylopharynx* de Man 1876)
"Spear" rods 2–3, base heavy, irreg.; setae 0 or papill.; ovary obscure...*Diphtherophora* de Man 1880
(=*Chaolaimus* Cobb 1893
=*Archionchus* Cobb 1913)
Structure of pharynx obvious
Oesophagus without median bulb, cardiac bulb present
Cardiac swelling cylindroid (i.e. oesophagus dorylaimoid)
Oral spear large, over 5%, base 3-bulbed but not trifurcate.....*Xiphinema* Cobb 1913
Oral spear smaller, under 5%, base trifurcate.....(*Tylencholaimus* de Man 1876)
Cardiac swelling pyriform to clavate
Spear 3-bulbed at base, ±stout; amphid protrusile, tube cuticularized.....*Triplonchium* Cobb 1920
Spear 3-pronged; amph. ¼ head-width, transverse-oval; labial papillae 6 *Tylolaimophorus* de Man 1880
Oesophagus with median bulb, often with cardiac swelling also
Body ±thick, not serpentine; ♀ and larval forms.....*Heterodera* Schmidt 1871
(=*Meloidogyne* Göldi 1887
=*Caconema* Cobb 1924)
Body ±serpentine
Junction oesoph.& intestine indef.;annules plain;tail rounded,with bursa..(*Hoplolaimus* Daday 1905)
Junction oesoph. & intestine definite; bursa none; ♂ and larval forms
Spear really the apophyses of 3 movable onchia at base anterior pharynx....*Tylenchodon* Fuchs 1930
Spear tylenchoid.....*Heterodera* Schmidt 1871
(=*Meloidogyne* Göldi 1887
=*Caconema* Cobb 1924)

Ovary 1 (for alternative see preceding page)
Gonad ♀ reflexed; setae 0
Spear trifurcate half its length, base swollen; oesoph. with cardiac bulb only..*Doryllium* Cobb 1920
Spear furcate at base only; bulbs usually 3
Body thick, inert; parasitic ♀ forms
Nema body swollen, head and neck narrow; vulva 90%; in citrus roots.....*Tylenchulus* Cobb 1913
Nema sausage-shaped;organs degenerated exc.gonads; vulva term.; in insects *Allantonema* Leuck. 1884
(=*Tylenchomorphus* Fuchs 1914)
Body ±slender or serpentine
Oral spear ±vestigial; median bulb ±reduced; ♂ and larval forms
Habitat in citrus roots and soil.....*Tylenchulus* Cobb 1913
Habitat in and around wood-boring beetles.....*Allantonema* Leuck. 1884
(=*Tylenchomorphus* Fuchs 1914)
Oral spear well developed
Median oesophageal bulb elongate; vulva over 70%, ovary anterior; bursa none
Spear 3–4%; annules 0; median bulb ±reduced; anus not functional.....*Tylenchulus* Cobb 1913
Spear 8–23%;annules under 150.retrorse;median bulb oft valvate;vulva 70–95%..*Ogma* Southern 1914
(=*Iota* Cobb 1913)
Median oesophageal bulb absent
"Spear" rods 2–3, base heavy, irreg.; setae 0 or papilloid; vulva 50%...*Diphtherophora* de Man 1880
(=*Chaolaimus* Cobb 1893
=*Archionchus* Cobb 1913)
"Spear" of usual structure, shaft distinct, base tripartite
Tip of spear tapering, posterior prongs little swollen; vulva 33–72%...*Tylencholaimus* de Man 1876
Tip of spear (dorso-ventral view) arrow-headed; vulva 25%, ovary post.*Pharetrolaimus* de Man 1921
Gonad ♀ outstretched
Habitat marine;"spear" an evertible pharyng.lining;amph.round;neck 4% *Siphonolaimus* de Man 1893
Habitat not marine; median oesophageal bulb present (Neotylenchus ?)
Cephalic setae 4, 1½ head-widths long; longitudinal striae 10; in cranberry bog..*Atylenchus* Cobb 1913
Cephalic setae 0
Dorsal oes.gland emptying at med.bulb;junct.oes.&intest.indef.;bursa 0 *Aphelenchoides* Fischer 1894
(=*Seinura* Fuchs 1931
=*Parasitaphelenchus* Fuchs 1930
=*Pathoaphelenchus* (Cobb) Steiner 1931)
Dorsal oes. gland emptying at base of spear; genera tylenchoid
Spear under 5%; junction oesoph. & intest. usually definite; nema under 5% wide; bursa present
Anterior oesoph. with median bulb; head of 6 sectors; tail without mucron....*Tylenchus* Bast. 1865
Anterior oesoph. fusiform to isthmus; median bulb not definite; in or about plants
Habitat crop plants; head of 8 sectors; terminus of tail straight.....*Neotylenchus* Steiner 1931
Habitat bladders of Fucus, & am'g marine algae; head of 6 sectors; tail hooked *Halenchus* Cobb 1933
Spear 8–24%; oesoph. lining flexible, looping; nema 5%+ wide; bursa 0; vulva 72–94%
Base of spear bulbed, not fluked; annules over 100, not retrorse; junct. oes. & intest. definite
Oral area not raised; annulation fine.....*Paratylenchus* Micol. 1922
Oral area raised, surrounded by "fossa"; annulation rather coarse.....*Procriconema* Micol. 1925
Base of spear anchor-shaped (fluked); annules under 150, retrorse; junct. oes. & intest. indef.
Scales, prickles and fringes absent from annules.....*Criconema* Hoffmänner & Menzel 1914
Scales, prickles or fringes ornamenting the annules.....*Ogma* Southern 1914
(=*Iota* Cobb 1913)

Spear plain, i.e. not bulbed at base (for alternative see page 8)
Oesophagus plain, i.e. without median or posterior bulb or swelling
Amphid known
External amph. reniform; dorsal onch. small, at spear base; ovary ant.; not marine *Enoplocheilus* Kreis 1932
External amphid circular, elliptical or monospiral
Spinneret absent; anus reduced; parasitic in beetles
Pharyng. bulb strong, head swollen; spear 1.5%; junct. oesoph. & intest. indef.; –♀ (*Rhabdonchus* Cobb 1933)
Pharyng. bulb none; spear vestigial; in beetle, Passalus; '♀ .... *Chondronema* Christie & Chitwood 1931 (= *Uracanthus* Dies. 1861)
Spinneret present; marine
Annules coarse exc. on head; onch. spear-like, axial; body set. in long. rows; –♀– *Aculeonchus* Kreis 1928
Annules none or fine; head not expanded; cephalic setae 4
Striae of dots, larger laterally; amph. multispire; spicula 2-jointed; –♀– .. *Dorylaimopsis* Ditlev. 1918 (= *Xinema* Cobb 1920)
Striae 0; amph. monospire; spicula entire; junct. oes. & intest. obscured by glands; eyes present
Spear 0.3%, a thickening of dorsal pharyngeal wall; ovaries 1 or 2, reflexed..... (*Onchium* Cobb 1920)
Spear more obvious, 1.5%; '♀' ..... *Onchulella* Cobb 1920
Amphid unknown or obscure
Female not known; spear a small prod at lips; marine ..... *Rhinonema* Allgen 1927
Female known
Spinneret present; ovaries 2; marine
Calvarium subcuticular; spear long, slender; set. on head long; nema 6 mm. *Thoracostomopsis* Ditlev. 1918
Calvarium none; head not suddenly narrowed; spear short; ovaries reflexed..... (*Onchulella* Cobb 1920)
Spinneret absent; ovary 1; not marine
The female saccate, sausage-shaped; vulva terminal, ovary reflexed; in beetles *Allantonema* Leuck. 1884 (= *Tylenchomorphus* Fuchs 1914)
The female ±elongate, usually not slender; vulva posterior, ovary anterior
Ovary outstretched; anus present; spear a mere prod, reduced in ♂; wings 0... *Iotonchium* Cobb 1920
Ovary reflexed exc. Rhabdonchus; anus none or reduced; parasitic in insects
Spear long, slender, in muscular bulb, head swollen; junct. oes. & intest. indef.. *Rhabdonchus* Cobb 1933
Spear vestigial, minute or none; pharyngeal bulb absent
Mouth and spear absent; in beetles, weevils, etc..... (*Bradynema* Strass. 1892)
Mouth and spear present in young ♀ only; in beetles, frit fly, etc.
Vulva degenerating; ♀ free-living; bursa pre-anal; in Passalus *Chondronema* Christie & Chitwood 1931 (= *Uracanthus* Dies. 1861)
Vulva remaining functional; adult ♀ parasitic; gubernaculum small
Anus none or vestigial; in cucumber beetle, Diabrotica..... *Howardula* Cobb 1921
Anus persisting; in frit-fly, Oscinella..... (*Tylenchinema* Goodey 1930)
Oesophagus with median or posterior bulb or swelling, or both
Amphid not known or obscure
Spinneret present; cardiac swelling slight; spear a small prod at lips; J..... (*Rhinonema* Allgen 1927)
Spinneret absent; cephalic setae 0
Nema parasitic, saccate female; vulva terminal; in beetles, etc.; '♀ ..... (*Allantonema* Leuck. 1884) (= *Tylenchomorphus* Fuchs 1914)
Nema free-living
Armature a minute labial prod; expanding head suddenly truncate; vulva 88%; –♀ *Iotonchium* Cobb 1920
Armature an obvious spear
Spear closed, bent dorsad at tip when extruded; '♀ ..... (*Campydora* Cobb 1920)
Spear open, a hollow passage; not bent at tip
Lips petaloid, lip reg. expanded, discoid; oesoph. dorylaimoid; spear small; '♀' *Antholaimus* Cobb 1913
Lips 0; median bulb valvate, with outlets of 3 glands; junction oesoph. & intestine indefinite; –♀
Gubernaculum and bursa present..... *Aphelenchus* Bast. 1865 (= *Isonchus* Cobb 1913)
Gubernaculum and bursa absent..... *Aphelenchoides* Fischer 1894 (= *Seinura* Fuchs 1931 = *Parasitaphelenchus* Fuchs 1930 = *Pathoaphelenchus* (Cobb) Steiner 1931)
Amphid known
External amphid spiral, circular or elliptical (for alternative see next page)
Spinneret present; amphid labial, ± spiral; "spear" filling posterior pharynx; marine
Width of nema 3.5%; pharyngeal bulb definite; '♀' ..... *Onyx* Cobb 1891
Width of nema 7%; pharyngeal bulb faint; J..... *Oistolaimus* Ditlev. 1921 (cf. *Onyx* Cobb 1891)
Spinneret absent; amphid circular or elliptical
Anus none; setae 0; pharyng. bulb strong; junct. oes. & intest. indef.; in beetles; –♀ *Rhabdonchus* Cobb 1933
Anus present; nema free-living
Cephalic setae 10, Siphonolaimus sometimes 0; amphid circular
Habitat marine; "spear" evertible phar. lining; nema 5–10 mm.; neck 4%; –♀ *Siphonolaimus* de Man 1893
Habitat moist soil; spear tooth-like; nema 0.85 mm.; neck 16%..... *Odontolaimus* de Man 1880 (= *Neonchus* Cobb 1893)
Cephalic setae 0
Spear bent dorsad at tip when extruded; amphid small, oval, at lips; '♀ ..... *Campydora* Cobb 1920
Spear not bent at tip
Med. oes. bulb 0; nema ±dorylaimoid; lab. papillae 6, cep. b. 6; ovaries 2 (*Tylolaimophorus* de Man 1880)
Med. oes. bulb valvate; nema ±tylenchoid; papillae 0; amphid oval, near lips
Junction of oesophagus and intestine ±definite
Gubernaculum and bursa absent; tail often with mucron; –♀ ..... *Paraphelenchus* Micol. 1925
Gubernaculum small; bursa without ribs; tail slender, long-conoid; –♀– *Psilenchus* de Man 1921
Junction oesoph. & intestine indefinite; oes. gland outlets at med. bulb; tail short; –♀
Bursa and gubernaculum present..... *Aphelenchus* Bast. 1865 (= *Isonchus* Cobb 1913)
Bursa and gubernaculum absent..... *Aphelenchoides* Fischer 1894 (= *Seinura* Fuchs 1931 = *Parasitaphelenchus* Fuchs 1930 = *Pathoaphelenchus* (Cobb) Steiner 1931)

External amphid a transverse slit, oft at lip reg.; ceph. set. 0; fresh water or soil (from preceding page)
Ovary 1, reflexed; spinneret 0 (Oionchus ?)
Spear a closed cutting or pricking organ, ±tooth-like; vulva 55–60%, ovary anterior
Spinneret (?) present; spear straight.....*Oionchus* Cobb 1913
Spinneret absent; tip of spear bent dorsad when extruded; amphid elliptical....*Campydora* Cobb 1920
Spear open at end, a hollow passage, tip not bent; oesophagus dorylaimoid
Anterior ⅔ of oesophagus narrow; cardiac swelling set off by constriction.....(*Doryllium* Cobb 1920)
Anterior ⅓–½ of oesophagus narrow; both parts cylindroid
Narrow part of oesophagus set off behind by constriction.....*Axonchium* Cobb 1920
Narrow part of oesophagus ±confluent with wider posterior part; ♀'.....(*Dorylaimus* Duj. 1845)
Ovaries 2, reflexed; oesophagus ±dorylaimoid
Spear a closed cutting or pricking organ, ±tooth-like
The spear long, slender, flexible; cardiac swelling slight, basal, ±clavate
Guide rings for spear absent; spear 30–40% of neck length.....*Trichodorus* Cobb 1913
Guide rings for spear present; spear ±20% of neck length.....*Leptonchus* Cobb 1920
The spear shorter, less slender, less flexible; cardiac swelling cylindroid, ⅓–¾ oesophagus
Tip of ventral spear oblique, ventrad when extruded; nema 6–10 mm.....*Sectonema* Thorne 1930
Tip of submedian spear straight; nema under 4.5 mm.....*Nygolaimus* Cobb 1913
Spear open at end, a hollow passage
Pharynx with cup-shaped anterior portion
Cup-shaped portion with 6 ribs; spear with guiding ring.....*Actinolaimus* Cobb 1913
Cup-shaped portion without ribs; spear without guide ring; lip region discoid..*Antholaimus* Cobb 1913
Pharynx without cup-shaped anterior portion
Oesophagus with fusiform "bulb" behind spear.....*Dorylaimellus* Cobb 1913
Oesophagus without swelling behind spear
Lip region discoid, much expanded.....*Discolaimus* Cobb 1913
Lip region usually not discoid, expanded little or not at all
Labial papillae 0, cephalic 6; circumoral ridge present; vulva 34%.....*Chrysonema* Thorne 1929
Labial papillae 6, cephalic 6; circumoral ridge absent.....*Dorylaimus* Duj. 1845

Armature of one or more teeth (odontia or onchia) (for alternative see page 8)
Tooth (onchium) 1 (for alternative see page 15)
Oesophagus plain, i.e. without median or posterior bulb or swelling; amphid occasionally obscure (pg. 13)
External amphid not spiral, circular nor elliptical (for alternative see next page)
Female not known
Habitat soil;spinneret 0;phar.¼ neck-length;onch.outward-acting;oes.dorylaimoid..*Nanonema* Cobb 1905 (=*Cephalonema* Cobb 1893)
Habitat marine
Annules coarse, elements tile-like; amphid crook-shape; ceph. set. 4; nema 0.7 mm.*Pselionema* Cobb 1933 (=*Steineria* Fil. 1922)
Annules not coarse; amphid not crook-shape
Onchium small. a labial prod; cephalic setae 6.....*Rhinonema* Allgen 1927
Onchium pharyngeal
Labial set. 6, cephalic 10; onchium dorsal; nema 0.5% wide; amphid transverse *Trileptium* Cobb 1933 (=*Trilepta* Cobb 1920)
Labial set. 0, cephalic 6; onchium ventral; nema over 4% wide.....*Doryonchus* Kreis 1932 (cf. *Symplocostoma* Bast. 1865)
Female known
Ovary 1; habitat not marine
Median onchium spear-like, dorsal onchium minute, basal.....*Enoplocheilus* Kreis 1932
Median spear-like onchium absent; ovary reflexed; Enoplidae
Pharynx tubular, depth 10 times width; tooth basal; cephalic setae 0.....*Cryptonchus* Cobb 1913 (=*Ditlevsenia* Micol. 1925)
Pharynx conoid when open, depth not over 3 times width
Tooth minute, basal, deep-set; denticles 0; spinneret terminal.....*Trischistoma* Cobb 1913
Tooth large, subventral; denticles present; other onchia 2; spinneret ventrad(*Mononchulus* Cobb 1918)
Ovaries 2
Gonads ♀ outstretched; spinneret present; striae plain; marine.....*Mononcholaimus* Kreis 1924
Gonads ♀ reflexed
Spinneret absent; amphidial opening oval or a transverse slit
Base of tooth without "flukes"; cephalic setae 6; onchium large, acute; in soil..*Onchulus* Cobb 1920
Base of tooth anchor-shaped, "flukes" dorsad and ventrad.....*Diphtherophora* de Man 1880 (=*Chaolaimus* Cobb 1893 =*Archionchus* Cobb 1913)
Spinneret present, exc. sometimes Eurystominae
Habitat not marine; Trilobinae
Pharynx closed; lips 3; onchium minute, basal, deepset.....*Tripyla* Bast. 1865 (=*Promononchus* Micol. 1923)
Pharynx open, domed, larger; lips 6; onchia often more than 1.....*Trilobus* Bast. 1865
Habitat marine
Striae conspicuous, resolvable into dots or rod-like elements; Chromadoridae
Amphid at lips, lenticular, oft obscure; cuticle of "basket-work" on neck *Euchromadora* de Man 1886 (=*Graphonema* Cobb 1898)
Amphid not at lips, of ±even width, conspicuous, reaching nearly across head
Cephalic setae 0; annules of obscure rod-like elements; spicula entire.....*Actinonema* Cobb 1920
Cephalic setae 10; annules on neck of "basket-work"
Spicula entire; amphid a wide transverse oval.....*Pareuchromadora* Stekhoven & Adams 1931
Spicula of 2 sections; amphid a narrow slit of even width.....*Rhips* Cobb 1920
Striae 0, or plain and very fine
External amph.bent or crook-shaped,plate oval,1 head-width;"tooth" minute *Diplopeltis* Cobb 1905 (=*Dipeltis* Cobb 1891 =*Discophora* Villot 1875)
External amphid not crook-shaped, plate absent; Enoplidae
Head with elaborate, ornate calvarium.....*Deontostoma* Fil. 1916
Head without calvarium
Pharynx of single chamber; cephalic setae 10

Mouth cavity ±quadrate; onchium minute, close against wall; eyes 0 *Anoncholaimus* Cobb 1920
Mouth cavity twice as deep as wide; dorsal onch. bent in over pharynx *Asymmetrella* Cobb 1920
Pharynx of more than 1 chamber; large onchium subventral
Onchium conoid to base of short stylet; phar. ±quadrate; ♂ supplements eurystomoid
Bulbs of oesophagus 5–8, serial, contiguous.....*Bolbella* Cobb 1920
Bulbs of oesophagus none
Cervical setae long, about 30; ♂ supplements weakly developed.....*Ledovtia* Fil. 1927
Cervical setae 0 or minute; ♂ supplements well developed.....*Eurystomina* Fil. 1921
(=*Eurystoma* Marion 1870
=*Marionella* Cobb 1922)
Onchium a long stylet; phar. much deeper than broad; ♂ an enchelid
Anterior oesophagus (pharynx ?) narrower, lumen wide.....*Calyptronema* Marion 1870
(=*Catalaimus* Cobb 1920)
Anterior oesophagus not differentiated
Vestibule set off by row of "comma" markings; pharyng. rings 3 *Symplocostomella* Micol. 1930
Vestibule not set off by a ring or rows of denticles or markings..*Symplocostoma* Bast. 1865
External amphid spiral, circular or elliptical (for alternative see preceding page)
Female not known; marine
Amphid multispire,big;phar.ribbed,complex;onch.3;♂ supplements chromadoroid *Pomponema* Cobb 1917
Amphid circular or oval (Rhinonema, Doryonchus?)
Annules of dots & rods,altered laterally;amph.transverse-oval *Pareuchromadora* Stekhoven & Adams 1931
Annules none or not ornamented; cephalic cuticle not thickened
Cephalic setae 6
Onchium a minute labial prod.....*Rhinonema* Allgen 1927
Onchium ventral, pharyngeal, slender, lance-like.....*Doryonchus* Kreis 1932
(cf. *Symplocostoma* Bast. 1865)
Cephalic setae 8 or 10
Oesophagus surrounding phar.; onch. opposed by denticles; amph. long-oval *Anaxonchium* Cobb 1920
Oesophagus ceasing at base of pharynx; denticles 0; amphid smaller, circular; Enoplidae
Pharynx of 1 chamber; onchium digitate.....*Cophonchus* Cobb 1920
Pharynx of 2 chambers; onchium a slender, subventral stylet.....*Isonemella* Cobb 1920
Female known
Ovary 1, anterior; onchium dorsal
Striae of dots; pharynx cyatholaimoid; ♀.....*Dentatonema* Kreis 1928
Striae none or plain; pharynx not cyatholaimoid
Pharynx large, open; onchium large, apex far forward; amphid with pocket *Pseudodilaimus* Kreis 1928
Pharynx small or closed, onchium basal or deepset, small
Gonad ♀ reflexed; striae 0; spinneret small; vulva 80%; in soil.....*Trischistoma* Cobb 1913
Gonad ♀ outstretched; onchium dorsal; amphid circular
The pharynx very small; oesophagus strongly developed.....*Prosphaerolaimus* Fil. 1918
The pharynx ⅓ head-width, as deep as wide; onch. central; in warm salt springs...*Anticyclus* Cobb 1920
Ovaries 2
Gonads ♀ outstretched; spinneret present; marine
Amphid not known; striae plain.....*Mononcholaimus* Kreis 1924
Amphid multispire; striae of dots
Head setose; striae not altered laterally; spicula long; apophysis absent.....*Comesoma* Bast. 1865
Head less setose; spicula short; gubernaculum with apophysis
Male ventral pre-anal supplementary organs small, papilloid.....*Parasabatieria* de Man 1907
Male supplementary organs absent.....*Sabatieria* de Rouville 1903
Gonads ♀ reflexed
Habitat soil or fresh water; cuticle without pores; wings 0
Amphid multispire; pharynx conoid; spinneret present; ♂ supplements none *Nannonchus* Cobb 1913
Amphid elliptical, with internal pocket; pharynx not conoid
Cephalic setae 0; labial papillae in 2 circlets; spinneret usually present.....*Mononchus* Bast. 1865
Cephalic set. 6, jointed; labial papillae 1 circlet; spinneret 0; about roots.....*Cyathonchus* Cobb 1933
Habitat marine and brackish waters
Nema broad, 16%; wings ±50; neck region "collared"; pharynx narrow.....(*Richtersia* Steiner 1916)
Nema slender, not over 5%; wings 0 exc. Rhinema 12
Amphid multispire; striae of dots; cuticular pores pres.; vestibule with 12 (6 double ?) ribs
Large ♂ supplement tubular,anterior to small supplements;nema viviparous *Acanthonchus* Cobb 1920
(=*Seuratia* Ditlev. 1918
=*Seuratiella* Ditlev. 1922)
Large ♂ supplement absent, others if tubular small; nema usually oviparous
Phar. tubular behind onch.; gubernacula not serrate; ♂ papill. setose *Paracyatholaimus* Micol. 1922
Phar. cyathiform; gubernacula serrate distally; ♂ setose papillae none
Dorsal onchium large, acute, projecting; striae altered laterally.....*Paracanthonchus* Micol. 1924
Dorsal onchium 0 or not projecting; pharyngeal ribs extending to base
Tail setaceous; onchium small; ♂ papillae present or not.....*Longicyatholaimus* Micol. 1924
Tail not setaceous
Dots larger laterally; ♂ supplements tubular; gubernac. oft joined *Praeacanthonchus* Micol. 1924
Dots not larger laterally; ♂ tubular supplements 0; gubernacula joined *Cyatholaimus* Bast. 1865
(=*Necticonema* Marion 1870)
Amphid circular, elliptical or monospiral
Wings 12, markings V-shaped; pharyng. bulb stronger dorsad; amphid circular....*Rhinema* Cobb 1920
Wings 0; striae plain
Dorsal pharyng. wall thick, tooth-like; amph. monospire at lips; ceph. set. 4; renette far back
Oesoph.glands obscuring junct.intest.;dorsal phar.element ±uniform,slighter *Onchium* Cobb 1920
Oesoph. glands not prominent; dorsal pharyng. element not uniformly thick, but heavy
Tooth-like thickening parallel to axis.....*Camacolaimus* de Man 1889
(=*Digitonchus* Cobb 1920
=*Acontiolaimus* Fil. 1918)
Tooth-like thickening bent outward from beginning of vestibule
Point of "onchium" single.....*Acmaeolaimus* Fil. 1918
Point of Y-shaped "onchium" duplex.....*Ypsilon* Cobb 1920

Dorsal pharyngeal wall not thickened; onchium a distinct projection (from preceding page)
Cephalic setae 20–30; cardiac glands conspicuous
Male supplementary organs complex; copulatory muscles conspicuous....*Xanthodora* Cobb 1920
Male supplements simple, papilloid; copulatory muscles not conspic. *Acanthopharynx* Marion 1870
Cephalic setae not over 10
Head with elaborately ornate calvarium; striae 0; spinneret present.....*Deontostoma* Fil. 1916
Head without calvarium; cuticular pores absent
Plate round,with "bent" amph.;phar.small;ceph.set.4,cerv.oft long,many *Diplopeltis* Cobb 1905
(=*Dipeltis* Cobb 1891
=*Discophora* Villot 1875)
Plate absent; pharynx large, complex, of more than 1 chamber; onchium large, sharp
Onchium conoid to base of short stylet; pharynx ±quadrate; ♂ supplements eurystomoid
Long cervical setae ±30; ♂ supplements weakly developed.....*Ledovitia* Fil. 1927
Long cervical setae 0
Tail rounded; spinneret oft present; ♂ supplements well developed...*Eurystomina* Fil. 1921
(=*Eurystoma* Marion 1870
=*Marionella* Cobb 1922)
Tail spicate; spinneret 0; ♂ supplements weakly developed.....*Pareurystomina* Micol. 1930
Onchium a long stylet; phar. much deeper than wide; ♂ an enchelid
Oesophageal bulbs 5–8, serial, contiguous.....*Polygastrophora* de Man 1922
Oesophageal bulbs 0
Anterior oesophagus (pharynx ?) narrower, lumen wide.....*Calyptronema* Marion 1870
(=*Catalaimus* Cobb 1920)
Anterior oesophagus not differentiated
Vestibule set off by row of "commas," pharyng. rings 3; eyes 0 *Symplocostomella* Micol. 1930
Vestibule set off by rows of denticles or markings, or by a ring
Pharyngeal chambers behind vestibule more than 2.....*Symplocostoma* Bast. 1865
Pharyngeal chambers behind vestibule 2; eyes 2.....*Dilaimus* Fil. 1927
(=*Amphistenus* Marion 1870)

Oesophagus with median or posterior bulb or swelling, or both (for alternative see page 11)
Amphid not known or obscure (for alternative see next page)
Female not known
Habitat soil;phar.tubular,¼ neck;onch.outward-acting;oes.dorylaimoid;spinneret 0 *Nanonema* Cobb 1905
(=*Cephalonema* Cobb 1893)
Habitat marine; pharynx not over ⅓ neck-length; spinneret present (Rhinonema?)
Pharyngeal bulb stronger dorsad; onchium pharyngeal; cephalic setae small or 0....*Iotadorus* Cobb 1920
Pharyngeal bulb absent; onchium a mere prod at lips; cephalic setae 6.....(*Rhinonema* Allgen 1927)
Female known
Ovary 1
Gonad ♀ outstretched;spinneret pres.;wings 10,marks V-shaped;ceph.set.4;marine (*Nudora* Cobb 1920)
Gonad ♀ reflexed; spinneret absent; not marine
Onchium (spear) bent dorsad at tip; amphid small, oval, at lips; in soil.....(*Campydora* Cobb 1920)
Onchium not bent obliquely at tip
Cardiac bulb not valvate; median bulb strong
Tooth recurved outward; long. striae present; ♂ supplements papilloid..*Diplogaster* M. Schultze 1857
Tooth forward-pointing, deepset; long. striae none; ♂ supplements setose....*Acrostichus* Rahm 1928
Cardiac bulb valvate; median bulb absent, oesophagus cephaloboid
Posterior pharynx muscular, lumen closed; vulva ±75%; tail ±blunt.....*Plectonchus* Fuchs 1930
Posterior pharynx ±open; vulva 53–65%; tail conoid, usually slender
Vagina directed inward, not heavily muscular; not viviparous.....*Macrolaimus* Maupas 1900
Vagina directed forward, heavily muscular; viviparous or ovoviviparous.....*Turbatrix* Peters 1927
(=*Anguillula* auctores)
Ovaries 2
Gonads ♀ outstretched; pharyngeal bulb ±globular.....(*Bolbolaimus* Cobb 1920)
(=*Bulbopharyngiella* Allgen 1929)
Gonads ♀ reflexed, exc. perhaps Demaniella
Spinneret absent; oesophagus with muscular median bulb, usually valvate
Cardiac bulb valvate
Lip region not set off; odontia absent.....*Poikilolaimus* Fuchs 1930
Lip region set off by constriction; curved odontia 2 or 4.....*Rhabditis* Duj. 1845
(=*Diploscapteroides* Rahm 1928)
Cardiac swelling not valvate, oesophagus diplogastroid
Onchium small, anterior; median bulb wide as long, wider than oesophagus *Neodiplogaster* Cobb 1924
Onchia larger, basal; "prod" at lips; median bulb not wider than oesophagus *Demaniella* Steiner 1914
(=*Demania* Steiner 1914)
Spinneret present; oesophagus without median bulb; wings often present; marine exc. Punctodora
Lip reg. protrusile; ceph. set. 4; renette long; excretory pore opp. pharynx..*Ptycholaimellus* Cobb 1920
Lip region not protrusile
Pharyngeal swelling stronger dorsad; ♂ supplements chromadoroid exc. Odontonema
Striae altered laterally; onchium large, dorsal, apex ventral.....*Hypodontolaimus* de Man 1886
Striae not altered laterally
Onchium solid, inward-pointing.....*Prochromadora* Fil. 1922
Onchium with internal cavity, forward-pointing
Tooth small.....*Chromadorita* Fil. 1922
Tooth very large, apex ventral; ♂ supplements papilloid.....*Odontonema* Fil. 1930
Pharyngeal swelling not stronger dorsad
Cardiac bulb long, 2- or 3-parted; striae altered laterally; tooth large, forward-pointing
The bulb with dilated lumen.....*Spilophorella* Fil. 1918
The bulb with lumen not dilated; ♂ supplements chromadoroid.....*Chromadorissa* Fil. 1917
Cardiac bulb short, not divided
Striae altered laterally, several rows of dots larger.....*Chromadora* Bast. 1865
Striae not altered laterally
Onchium solid, inward-pointing; ♂ supplements chromadoroid.....*Prochromadora* Fil. 1922
Onchium with internal cavity, forward-pointing
Tooth small, sharp; ♂ supplements chromadoroid.....*Chromadorita* Fil. 1922
Tooth large, irregularly rectangular; cardiac bulb very large, simple.....*Punctodora* Fil. 1930

Amphid known (for alternative see preceding page)
External amphid not spiral, circular nor elliptical, but a transverse slit
Female not known; amphid large
Pharyngeal bulb not stronger dorsad; ceph. set. 10; cutic. "basket-work" on neck *Nygmatonchus* Cobb 1933
Pharyngeal bulb stronger dorsad; striae of dots
Denticles in pharynx numerous; cephalic setae 4; in humus near sea coast.....*Denticulella* Cobb 1933
Denticles 0; cephalic setae if present almost invisible; marine.....*Iotadorus* Cobb 1920
Female known
Ovary 1, reflexed; habitat soil about roots
Tooth short, closed, not bent at tip; ovary anterior, vulva 57%; spinneret(?) present *Oionchus* Cobb 1913
Tooth (spear) bent obliquely dorsad at tip when extruded; spinneret absent.....*Campydora* Cobb 1920
Ovaries 2, reflexed; spinneret present
Oesophageal bulbs 5–8, contiguous; amphid with pocket; ♂ supplements eurystomoid *Bolbella* Cobb 1920
Oesophageal bulbs not more than 2, not contiguous
Tooth small, near lips; setae 0; pharynx long, tubular; in fresh water.....*Rhabdolaimus* de Man 1880
Tooth not small; pharynx ±1 head-width deep; amphid usually at lips
Onchium curved, solid, apparently mobile radially.....*Prochromadora* Fil. 1922
Onchium forward-pointing or ±rectangular, motion apparently ±parallel to axis
Lip reg. protrusile; ceph. set. 4; renette long; excretory pore opp. pharynx..*Ptycholaimellus* Cobb 1920
Lip region not protrusile
Neck with cuticular "basket-work"; 4 sublat. scales opp. phar.; spicula 2 sections *Rhips* Cobb 1920
Neck without "basket-work," or laterally only; scales 0; spicula entire
Striae of rod-like elements, exc. towards extremities, changing to large dots laterally
Cardiac bulb broad, well set off, valvate.....*Punctodora* Fil. 1930
Cardiac bulb not very broad, confluent, non-valvate.....*Neochromadora* Micol. 1924
Striae of dots, altered laterally
Pharyngeal bulb stronger dorsad; onch. large; card. bulb 2- 3-zoned..*Hypodontolaimus* de Man 1886
Pharyngeal bulb if present not stronger dorsad; cardiac bulb not zoned....*Chromadora* Bast. 1865
External amphid spiral, circular or elliptical
Female not known; marine or salt marsh (exc. Amphispira ?); wings none
Habitat soil (possibly marine); amphid spiral; cephalic setae 0; spinneret present *Amphispira* Cobb 1920
Habitat marine or salt marsh
Amphid multispire, large, on front curvature of head
Striae altered laterally.....*Neotonchus* Cobb 1933
Striae not altered laterally.....*Amphispira* Cobb 1920
Amphid not multispiral
Onchium spear-like, free at tip.....*Oistolaimus* Ditlev. 1921
(cf. *Onyx* Cobb 1891)
Onchium not spear-like
Cephalic setae minute; pharyng. bulb stronger dorsad; amphid narrow, transverse *Iotadorus* Cobb 1920
Cephalic setae 0; amphid circular or monospiral
Tooth ventral.....*Crassolaimus* Kreis 1929
Tooth dorsal; nema cephalated by expansion and by cessation of striae.....*Micromicron* Cobb 1920
Female known
Ovary 1
Gonad ♀ outstretched; amphid circular; cephalic setae 4; spinneret present; marine
Wings 10, of V-shaped marks; phar. bulb long, set off by constrict.; lab. papill. setose *Nudora* Cobb 1920
Wings 0; phar. bulb very slight; labial papillae 0; renette large, of ±6 cells.....*Synonema* Cobb 1920
Gonad ♀ reflexed
Habitat marine; amphid round; spinneret pres.; wings 6–20, marks V-shaped *Monoposthia* de Man 1889
Habitat not marine; amphid round or oval; spinneret none exc. Udonchus
Median oesophageal bulb present, usually valvate; tail conoid, then setaceous; bursa none
Pharynx narrow, post. part 6 times width; ceph. set. 0; onch. small, basal *Diplogasteroides* de Man 1912
Pharynx not more than twice as deep as wide; cephalic setae usually present
Onchium anterior, recurved, outward-acting.....*Diplogaster* M. Schultze 1857
Onchium deepset, forward-pointing.....*Acrostichus* Rahm 1928
Median oesophageal bulb absent; striae fine, plain
Pharynx occupying ½ neck-length; habitat decaying bulbs.....(*Odontopharynx* de Man 1912)
Pharynx occupying ¼ neck-length or less
Tooth (spear) bent obliquely dorsad at lips when extruded; soil near roots..(*Campydora* Cobb 1920)
Tooth not bent
Spinneret present; external amphid oval; pharyng. bulb absent; in fresh water *Udonchus* Cobb 1913
Spinneret absent; amphid circular
Pharyngeal swelling absent; cardiac bulb valvate.....*Macrolaimus* Maupas 1900
Pharyngeal swelling clavate; in moist soil.....*Odontolaimus* de Man 1880
(=*Neonchus* Cobb 1893)
Ovaries 2
Gonads ♀ outstretched; spinneret present; habitat marine or brackish soil
Amphid not multispire; onchia several, often minute
Pharyngeal bulb none, or slight, confluent; ceph. setae 4; labial papillae 6..*Microlaimus* de Man 1880
Pharyngeal bulb almost globular; cephalic setae 6; labial setae 6.....(*Bolbolaimus* Cobb 1920)
(=*Bulbopharyngiella* Allgen 1929)
Amphid multispire; striae finely dotted; pharyngeal bulb absent
Head setose; striae not altered laterally; spicula long; apophysis none.....*Comesoma* Bast. 1865
Head less setose; spicula short; gubernaculum with apophysis
Male ventral pre-anal supplementary organs small, papilloid.....(*Parasabatieria* de Man 1907)
Male supplementary organs absent.....(*Sabatieria* de Rouville 1903)
Gonads ♀ reflexed
Spinneret absent (for alternative see next page)
Habitat marine; cephalic setae 4; pharyngeal bulb absent, pharynx small.....*Spirina* Fil. 1918
(=*Spira* Bast. 1865)
Habitat not marine; tail ±setaceous exc. Neodiplogaster
Cardiac bulb valvate.....*Poikilolaimus* Fuchs 1930
Cardiac bulb not valvate
Pharyngeal bulb clavate, $\frac{1}{10}$–$\frac{1}{4}$ neck-length; median bulb none; ceph. set. 10 *Odontolaimus* de Man 1880
Pharyngeal bulb none or short, not tapering; oesoph. diplogastroid; onchium a projection

Median oesophageal bulb not swollen; ceph. set. 0; striae plain....(*Odontopharynx* de Man 1912)
Median oesophageal bulb swollen; cardiac swelling non-valvate
Pharynx ½ wide as deep; ceph. set. present; tail setaceous; bursa 0....*Diplogaster* M. Schultze 1857
Pharynx narrow, posterior tubular portion not over ½ as wide as deep; ceph. set. 0
Onchium basal; tail conoid then setaceous; bursa none.....*Diplogasteroides* de Man 1912
Onchium anterior; striae of dots; tail conoid; bursa rhabditoid.....*Neodiplogaster* Cobb 1924
Spinneret present, exc. sometimes Spirina (for alternative see preceding page)
Oesophageal bulbs 5–8, serial, contiguous; ♂ an enchelid; marine.....*Polygastrophora* de Man 1922
Oesophageal bulb 1
Anterior oesophagus narrow, lumen wide; marine.....*Calyptronema* Marion 1870
(=*Catalaimus* Cobb 1920)
Anterior oesophagus not differentiated
Wings present
Pharyngeal bulb set off by constriction; wings 12, bristles retrorse; marine...*Rhinema* Cobb 1920
Pharyngeal bulb none or confluent
Nema cephalated by cuticular change & ± by expansion; cardiac bulb short, not divided
Head "punctate"; wings 12–18; ceph. set. 6; denticles pres.; amph. spiral *Desmodorella* Cobb 1933
Head plain;wing 1;ceph.set.0;denticles 0;amph.round;caud.gl'nds pre-anal *Xenonema* Cobb 1920
Nema not cephalated; cardiac bulb long, 2- or 3-zoned; amphid spiral
Striae of dots; wings scalariform; ♂ supplements 0.....*Spilophorium* Cobb 1933
(=*Spilophora* Bast. 1865)
Striae plain
Cephalic setae many, jointed; ♂ pre-anal cuticle thickened.....*Neonyx* Cobb 1933
Cephalic setae 4, short; wing 1; ♂ supplements post-anal.....*Metachromadora* Fil. 1918
(=*Chromadoropsis* Fil. 1918)
Wings 0; striae not altered laterally, exc. sometimes Desmodora
Habitat freshwater; minute subordinate onchia usually present
Pharynx behind onchia ±parallel-sided; pharyngeal bulb definite.....*Ethmolaimus* de Man 1880
Pharynx behind onchia ±conoid; pharyngeal bulb absent
Amphid spiral; cephalic setae usually 10; pharynx open, irregular.....*Achromadora* Cobb 1913
Amphid circular; cephalic setae 4; pharynx often obscure.....*Prodesmodora* Micol. 1923
Habitat marine
Dorsal pharyngeal wall thickened, onchium-like; amphid monospire at lips; cephalic setae 4; renette far back
Oesoph. glands obscuring junction of intest.; dorsal phar. element ±uniform *Onchium* Cobb 1920
Oesoph. glands not prominent; dorsal pharyng. element not uniformly thick, but heavy
Tooth-like thickening parallel to axis.....*Camacolaimus* de Man 1889
(=*Digitonchus* Cobb 1920
=*Acontiolaimus* Fil. 1918)
Tooth-like thickening bent outward from beginning of vestibule
Point of "onchium" single.....*Acmaeolaimus* Fil. 1918
Point of Y-shaped "onchium" duplex.....*Ypsilon* Cobb 1920
Dorsal pharyngeal wall not thickened; onchium a distinct projection
Cephalic setae 12–26; cardiac bulb elongate; amphid spiral
Striae of dots, on head also; labial papillae setose; ceph. set. 12.....*Bradylaimus* Stekhoven 1931
Striae plain, absent on head; cephalic setae 24–26; amphid monospire
Pharynx denticulate; onch. sigmoid ventrally; ♂ supplements sigmoid *Sigmophora* Cobb 1933
Pharynx not denticulate; onch. not sigmoid; ♂ supplements papilloid *Xanthodora* Cobb 1920
Cephalic setae 4
Striae of dots
Dorsal onchium large, basal; pharyngeal bulb stronger dorsad.....*Odontonema* Fil. 1930
Dorsal onchium anterior; pharyngeal bulb ±symmetrical.....*Chromadorina* Fil. 1918
Striae plain
Head set off by lack of striae; pharynx & onchium inconspic.; marine..*Desmodora* de Man 1889
Head not set off; striae extending to lips
Pharyngeal bulb 0; cardiac bulb short; onchium minute; neck 6–7%.....*Spirina* Fil. 1918
(=*Spira* Bast. 1865)
Pharyngeal bulb present; cardiac bulb long, massive, 2- or 3-zoned; neck over 12%
Onchium spear-like; head rounded.....*Onyx* Cobb 1891
Onchium not spear-like; head truncate.....*Metachromadora* Fil. 1918
(=*Chromadoropsis* Fil. 1918)

Teeth (onchia or odontia) 2 or more (for alternative see page 11)
Oesophagus with median or posterior bulb or swelling, or both (for alternative see page 17)
The teeth ±equal in size, usually mobile radially (for alternative see next page)
Stroke of teeth outward; amphid often obscure (for alternative see next page)
Spinneret absent; '♀ or '♀'
Cardiac bulb valvate; cuticle without longitudinal striae.....*Diploscapter* Cobb 1913
Cardiac bulb not valvate, median bulb valvate; cuticle with longitudinal striae
Posterior pharyngeal chamber behind onchia; lips with radiate framework.....*Mononchoides* Rahm 1928
Posterior pharyngeal chamber absent; lips without radiate framework.....*Diplogaster* M. Schultze 1857
(=*Pristionchus* Kreis 1932)
Spinneret present; median oesophageal bulb absent
Pharynx tubular, 4–6% of body length
Amphid long, reaching base of pharynx or mid-body; odontia 6, minute; –♀–.....*Pseudolella* Cobb 1920
Amphid small, at lips, with pocket; odontia 3, massive; tail oft striate; '♀'....*Syringolaimus* de Man 1888
Pharynx conoid, not over 2% of body length
Striae plain
Odontia 0;onch. 3, at base shallow phar.;amph. round; card. swelling obvious; –♀ *Aponchium* Cobb 1920
Odontia 6 or 12;onch. 0;amph. bent or crook-shape;card. bulb 0 or weak; –♀– *Odontophora* Bütsch. 1874
(=*Trigonolaimus* Ditlev. 1918
=*Conolaimus* Fil. 1918)
Striae of dots; cardiac swelling obvious
Amphid spiral;onch.3,curved; ♂ supplements 0 or papilloid; gubernac. 0; ♂ only..*Statenia* Allgen 1930
Amphid a transverse slit, near lips; '♀'
Lateral fields marked by longitudinal rows of larger dots.....*Chromadorella* Fil. 1918
Lateral fields without longitudinal rows of larger dots.....*Prochromadorella* Micol. 1924

Stroke of teeth inward; amphid occasionally obscure (for alternative see preceding page)
Spinneret 0; phasmids present; odontia 6; oesophagus cephaloboid; ovaries reflexed
Nema usually cephalated; cirri 0; amphid round; soil & fresh water; '♀'....(*Teratocephalus* de Man 1876)
Nema not cephalated; cirri 6; amphid oval; tail hooked; in bark, etc.; '♀.....(*Chambersiella* Cobb 1920)
(=*Diastolaimus* Rahm 1928)

Spinneret present
Mandibular jaws 2 or 3; pharyngeal and cardiac bulbs strong; marine
Jaws 3; amphid not known; ♂ only.....*Fusonema* Kreis 1928
Jaws 2, lateral, dentate; amphid multispire.....*Cheironchus* Cobb 1917
(=*Dignathonema* Fil. 1918)

Mandibular jaws absent
Amphid multispire; lips flat, confluent; pharynx rather narrow; marine
Striae very fine; wings 0; labial papillae not seen; ♂ only.....(*Alaimonema* Cobb 1920)
Striae ±coarse, of dots; wings pres.; labial papillae 12; ⁻♀⁻, or reflexed at tip (*Mesonchium* Cobb 1920)
(=*Pepsonema* Cobb 1920)

Amphid not multispire
Habitat soil;amph.monospire to crook-shape;phar. 6%;nema small,0.2 mm.;J (*Pycnolaimus* Cobb 1920)
Habitat marine; pharynx under 2%, not tubular; ovaries not reflexed
Vulva 15%; odontia 12, minute; amphid "folded"; ♀⁻.....*Synodontium* Cobb 1920
Vulva 81%; odontia 0; onchia 3; pharyngeal swelling slight; ⁻♀.....(*Aponchium* Cobb 1920)
The teeth ±unequal in size, usually not mobile radially; amph. usually not obscure (from preceding page)
External amphid not spiral, circular nor elliptical; ovaries 2; spinneret present
Gonads ♀ outstretched;amph. long, reaching sometimes to mid-body;odontia 6;⁻♀⁻ *Pseudolella* Cobb 1920
Gonads ♀ reflexed; amphid a transverse slit
Striae fine, plain; onchia dorsal and ventral.....*Deltanema* Kreis 1929
(cf. *Metalinhomoeus* de Man 1907)

Striae resolvable into elements; dorsal onchium usually the largest
Spicula of 2 joints; striae forming "basket-work" on neck; amphid opp. base pharynx *Rhips* Cobb 1920
Spicula entire; striae of dots; amphid near lips.....*Chromadora* Bast. 1865
External amphid spiral, circular or elliptical
Female not known; spinneret present; marine
Amphid multispire;head conoid;onch. minute;ceph. & subceph. setae in sets of 4 *Alaimonema* Cobb 1920
Amphid circular, elliptical or monospiral
Pharynx surrounded at base by cuticularized ring.....*Cricolaimus* Southern 1914
Pharynx not surrounded by cuticularized ring
Striae of dots, interrupted laterally; pharynx cyatholaimoid, onchium large....*Endolaimus* Fil. 1922
Striae unaltered laterally; pharynx small; ♂ supplements tubular, post-anal.....*Catanema* Cobb 1920
Female known
Ovary 1
Gonad ♀ outstretched;spinneret pres.;♂ supplements numerous,complex;marine *Aponchium* Cobb 1920
Gonad ♀ reflexed; amphid small, circular, obscure; spinneret 0; not marine
Cardiac bulb valvate, median bulb absent; bursa small, ribs stout.....*Myolaimus* Cobb 1920
Cardiac bulb not valvate; oesophagus ±diplogastroid
Oesophagus without (or with non-valvate, clavate) median swelling.....*Odontopharynx* de Man 1912
Oesophagus with median valvate bulb.....*Diplogaster* M. Schultze 1857
(=*Pristionchus* Kreis 1932)

Ovaries 2
Gonads ♀ outstretched, Mesonchium reflexed at tips; marine
Amphid spiral; dots larger laterally; onchia ±equal; spinneret present.....(*Mesonchium* Cobb 1920)
(=*Pepsonema* Cobb 1920)

Amphid circular; striae when present not altered laterally; onchia unequal
Striae desmodoroid, coarse, plain; amph. behind pharynx, open caudad *Paracothonolaimus* Schulz 1932
Striae none, or not desmodoroid
Pharyngeal bulb ±globular, set off by constriction; spinneret present.....*Bolbolaimus* Cobb 1920
(=*Bulbopharyngiella* Allgen 1929)
Pharyngeal swelling slight, confluent; base of pharynx denticulate.....*Linhomoeus* Bast. 1865
(i.e. subg. *Eulinhomoeus* de Man 1907)

Gonads ♀ reflexed (Mesonchium at tips only)
Habitat marine; spinneret present; amphid spiral
Striae of dots; amphid opposite pharynx, of few winds
Subventral onchium small, dorsal acting out; dots unaltered laterally....*Chromadorina* Fil. 1918
Subventral & dorsal onchia ±equal, apices axial; dots larger laterally.....*Mesonchium* Cobb 1920
(=*Pepsonema* Cobb 1920)

Striae none or plain
Head set off by cessation of coarse annulation; amphid usually multispire...*Desmodora* de Man 1889
Head not set off; striae none or very fine
Male ventral pre-anal supplements tubular, sigmoid, in 2 rows.....*Polysigma* Cobb 1920
Male ventral pre-anal supplements simple, in 1 row.....*Chromaspirina* Fil. 1918
(=*Mesodorus* Cobb 1920)

Habitat not marine
Spinneret present; amphid spiral, behind pharynx; in fresh water.....*Achromadora* Cobb 1913
Spinneret absent; phasmids present; amphid circular; usually in soil
Cardiac bulb valvate, oesophagus cephaloboid; onchia 4.....*Seleneella* Rahm 1932
Cardiac bulb not valvate; oesophagus diplogastroid
Anterior oesophagus (corpus) without (or with clavate, non-valvate) swelling
Cephalic setae 6 or 10; dorsal onch. opposed by ventral onchium or ridge....*Butlerius* Goodey 1929
Cephalic setae 6; dorsal onchium opposed by denticles.....*Odontopharynx* de Man 1912
Anterior oesophagus (corpus) ending in ±valvate median bulb
Lips with radiate framework; post. pharyngeal chamber behind onchia...*Mononchoides* Rahm 1928
Lips without radiate framework; post. pharyngeal chamber none.....*Diplogaster* M. Schultze 1857
=*Pristionchus* Kreis 1932)

Oesophagus plain, i.e. without median or posterior bulb or swelling (for alternative see page 15)
The teeth ±equal in size, usually mobile radially (for alternative see next page)
Stroke of teeth outward; amphid usually not obscure
External amphid spiral, circular or elliptical; spinneret present (Eleutherolaimus ?)
Armature of 2 teeth;ceph. set. 4;amph. monospire,in front of setae;♂ only *Diodontolaimus* Southern 1914
Armature of 6 or 12 odontia
Odontia 3-jointed,heavy;phar. cylind.;onch. dorsal;amph. round-multispire; ⁻♀ *Scaptrella* Cobb 1917
Odontia not jointed
Amphid "folded" or shepherd's crook; ⁻♀⁻ ..... *Odontophora* Bütsch. 1874
(=*Trigonolaimus* Ditlev. 1918
=*Conolaimus* Fil. 1918)
Amphid circular or elliptical, sometimes obscure; cephalic setae 4
Pharynx obscure; odontia small; lab. set. 6, setae long; striae coarse; '♀' *Stephanolaimus* Ditlev. 1918
Pharynx obvious; odontia larger; labial and subcephalic setae 0; ♂ only
Striae of dots; amphid transverse, open caudad ..... *Apodontium* Cobb 1920
Striae plain; amphid circular ..... *Eleutherolaimus* Fil. 1922
External amphid not spiral, circular nor elliptical; spinneret pres. exc. Ironus and Paironus
Cardiac bulb slight; striae of dots; amphid a transverse slit near lips; '♀'
Dots of striae larger laterally, in longitudinal rows ..... (*Chromadorella* Fil. 1918).
Dots of striae not altered laterally ..... (*Prochromadorella* Micol. 1924)
Cardiac bulb none; striae none, or plain and very fine
Odontia 6, sometimes dentate; amphid ±"folded" or crook-shaped; ⁻♀⁻
Amphid opposite basal portion of pharynx; odontia less developed ..... *Axonolaimus* de Man 1889
Amphid opposite anterior portion of pharynx; odontia more developed ..... *Odontophora* Bütsch. 1874
(=*Trigonolaimus* Ditlev. 1918
=*Conolaimus* Fil. 1918)
Odontia or onchia 3; amphid transverse, with internal pocket; ovaries reflexed
Armature 3 awl-shaped onchia, protrusile forward; pharynx 0.5%; '♀' ..... (*Fimbrilla* Cobb 1905)
(=*Fimbria* Cobb 1894)
Armature 3 heavy odontia; pharynx tubular, 1–4%; Ironinae
Lips expanded, denticulate, 6; tail 2%; spinneret ventrad; ♀' ..... *Trissonchulus* Cobb 1920
Lips not expanded; tail 5% or more; spinneret not ventrad; '♀'
Spinneret none; pharynx 2–4%; dorsal tooth duplex; in fresh water and soil ..... *Ironus* Bast. 1865
Spinneret present (in Paironus rudimentary or none); marine
Cephalic setae 0 or papilloid; odontia not duplex; pharyngeal swelling slight
Pharyngeal wall thin; pharynx 3%; nema 3 mm ..... *Dolicholaimus* de Man 1888
Pharyngeal wall thick; pharynx 1.1%; nema 2–7 mm ..... *Thalassironus* de Man 1889
Cephalic setae present
Odontia duplex; phar. 2.7%, bulb set off by constriction; ceph. set. 6, subceph. 4. *Ironella* Cobb 1920
Odontia not duplex; pharynx 1–1.6%, swelling slight; cephalic setae 10 ..... *Paironus* Micol. 1930
Stroke of teeth inward; amphid known, in Enoplidae with internal pocket and often obscure
External amphid not spiral, circular nor elliptical; ovaries reflexed
Ovary 1, post.; phar. bulb strong; "palps" labial; onch. 3, at summit of apophyses *Gammanema* Cobb 1920
Ovaries 2; wings absent; amphid with internal pocket; Enoplidae
Calvarium a band with undulating margins; glands lateral; odontia large ..... *Fiacra* Southern 1914
Calvarium absent
Onchia 3, awl-like, protrusile forward, like bristles around open mouth ..... *Fimbrilla* Cobb 1905
(=*Fimbria* Cobb 1894)
Onchia not awl-like
Lips confluent, bearing 6 (or 3 duplex) odontia
Pharynx narrow; onchia 0; odontia probaby 6 ..... *Tubolaimella* Cobb 1933
Pharynx conoid; onch. 3, midway, alternating paired odontia. *Rhabdodemania* Baylis & Daubney 1926
(=*Demania* Southern 1914)
Lips distinct, 3; armature heavy
The lips large, conoid, as high as broad; jaws 3
Mandibles 2-clawed; lips radially striate; spicula long, striate ..... *Enoploides* Saveljev 1912
Mandibles absent; lips not striate; tooth midway on onchial framework ... *Enoplolaimus* de Man 1893
The lips not conoid, nor as high as broad
Armature 3 short flattish acute onchia, doming the ±small pharynx .... *Triodontolaimus* de Man 1893
Armature of 3 jaws within the pharynx, anteriorly 2-pointed ..... *Enoplus* Duj. 1845
(=*Enoplostoma* Marion 1870)
External amphid spiral, circular or elliptical
Female not known
Amphid monospire, transverse; lips 4; cephalic setae 4; ♂ supplements 8–12, tubular
Striae very fine; pharynx conoid; onchia 3; labial papillae 2 ..... *Dagda* Southern 1914
Striae coarse; phar. cylind.; onch. 2, lateral or subventral; lab. papill. 4 *Diodontolaimus* Southern 1914
Amphid multispire; ♂ supplements ±chromadoroid
Pharynx unarmed; lips 6, grasping organs, with longitudinal cuticular ribs ..... *Dispira* Cobb 1933
Pharynx armed, bulb strong; often nativorous; ♂ supplements chromadoroid
Mandibles 3, split exc. at tips, distal hooks 3, subordinates 2; phar. 1 chamber. *Synonchium* Cobb 1920
Mandibles 0; phar. 2 chambers; onchia 3, midway, with backward apophyses. *Trogolaimus* Cobb 1920
Female known
Ovary 1; amphid circular or monospiral (for alternative see next page)
Gonad ♀ post.;onch.3, on apophyses;phar.bulb strong;spinneret pres.;marine *Gammanema* Cobb 1920
Gonad ♀ anterior
Spinneret none; wings none; labial "palps" 6, small; marine; ⁻♀
Amphid large, raised centrally; tail with thorn-like setae ..... (*Zanema* Cobb 1920)
Amphid small, not projecting; tail without setae ..... (*Crystallonema* Cobb 1920)
Spinneret present
Cephalic setae usually 0 or papilloid; ovoviviparous or viviparous; in gills of land crabs
Pharynx small, of 2 chambers; cephalic setae 10, often papilloid ..... (*Monhystrium* Cobb 1920)
Pharynx large, open, of 1 chamber; cephalic setae 0; wings none ..... *Tripylium* Cobb 1920
Cephalic setae present; ovary outstretched; marine
Lips thick, with 3 projecting finger-like "odontia"; wings up to 32 on head ..... (*Xyala* Cobb 1920)
Lips 6, very thin, each with 3 parallel-sided cuticularized ribs ..... (*Daptonema* Cobb 1920)
(cf. *Theristus* Bast. 1865)

Ovaries 2 (for alternative see preceding page)
Gonads ♀ outstretched; spinneret present; marine
Amphid "folded" or crook-shaped; pharynx conoid; striae plain.....(*Axonolaimus* de Man 1889)
Amphid multispire; striae of dots, altered on lateral fields
Spicula 2-jointed; nema 2% wide.....*Dorylaimopsis* Ditlev. 1918 (=*Xinema* Cobb 1920)
Spicula entire; nema 4% wide.....*Mesonchium* Cobb 1920 (=*Pepsonema* Cobb 1920)
Gonads ♀ reflexed; spinneret present
Amphid large, multispire; striae resolvable into elements; often nativorous
Pharynx 2 chambers; mid-pharynx denticulate, apophyses forward & backward; striae of dots
Circular muscles about anterior pharynx; phar. small; denticles irregular..*Cobbionema* Fil. 1922
Circular muscles none; pharynx capacious; denticles regularly placed *Halichoanolaimus* de Man 1886 (=*Smalsundia* Allgen 1929)
Pharynx not of 2 chambers; denticles absent (Demonema ?)
Mandibles none
Dots of striae not larger laterally; jaws with many horny teeth anteriorly....*Demonema* Cobb 1894
Dots of striae larger laterally; onchia equal, apices axial.....*Mesonchium* Cobb 1920 (=*Pepsonema* Cobb 1920)
Mandibles 2 or 3; Selachineminae
Dorsal mandible a mere rod, developed mandibles 2.....*Selachinema* Cobb 1915
Dorsal mandible developed, making 3, ±split; subordinate hooks pres.; cutic. pores pres.
Central mandibular prong 1, no. hooks odd; striae of dots; ♂ supplements 2 *Synonchium* Cobb 1920
Central mand.prongs 2,no.hooks even;stri.dots, dashes;♂ supplements 20 *Synonchiella* Cobb 1933
Amphid small, opening circular, obscure; lips 3, large; Enoplinae
Lips not conoid, nor high as broad; labial papillae seldom setose; jaws 2-pointed..*Enoplus* Duj. 1845 (=*Enoplostoma* Marion 1870)
Lips large, conoid, often as high as broad; labial papillae 6, setose
Mandibles 2-clawed; lips radially striate; spicula long, striate.....*Enoploides* Saveljev 1912
Mandibles absent; lips not striate
Basal onchia large, reaching lips
Framework of jaws absent.....*Saveljevia* Fil. 1927
Framework of jaws present.....*Filipjevia* Kreis 1928
Basal onchia absent; "jaws" 3, without hooks
Jaw framework bearing 3 equal mid-pharyngeal teeth.....*Enoplolaimus* de Man 1893
Jaw framework without teeth.....*Parenoplus* Fil. 1927
The teeth ±unequal in size, usually not mobile radially; amph., in Enoplidae, oft obscure (from pg. 17)
Female not known
Cephalic setae 0; spiculum 1, gubernaculum absent.....*Dioncholaimus* Kreis 1932
Cephalic setae pres.; spicula 2, gubernac. pres. (Hyptiolaimus, Cacolaimus, Convexolaimus, J only)
Amphid multispire, ±head width; striae of dots, wings 2; labial "palps" 12, jointed *Pomponema* Cobb 1917
Amphid circular, elliptical or monospiral
Pharynx with denticles, or many subordinate onchia; labial papill. 6, setose; amph. round or oval
Labial "palps"12, tips large; onch. dorsal, denticles not basal; wing scalariform *Anaxonchium* Cobb 1920
Labial "palps" 0; base of pharynx filled with subordinate onchia.....*Polydontus* Schulz 1932
Pharynx without denticles or numerous subordinate onchia
Bulb around pharynx set off by sudden constriction.....*Hyptiolaimus* Cobb 1930
Bulb around pharynx none or not set off by constriction
Striae coarse; onchia 2, lateral or subventral; labial papillae 4.....*Diodontolaimus* Southern 1914
Striae none or very fine; onchia 3
Lips 4, 2 of them bearing papillae; cephalic setae 4; ♂ supplements tubular...*Dagda* Southern 1914
Lips 6, papillae 6, setose; cephalic setae 10, short; J
Head set off by thicker cuticle; wall of pharynx thin.....*Cacolaimus* Kreis 1932
Head not set off, its cuticle thin; wall of pharynx distinct.....*Convexolaimus* Kreis 1928
Female known
Ovary 1, anterior (Pseudoncholaimus ?)
Median onchium spear-like, dorsal onchium minute, basal.....*Enoplocheilus* Kreis 1932
Median spear-like onchium absent
Gonad ♀ outstretched; amphid circular or monospiral
Onchia 2, like vertical plates, subventral; amphid monospire, longer than wide..*Gonionchus* Cobb 1920
Onchia not plate-like, basal, outlets of oesoph. glands; amph. round; tail ±setaceous *Cobbia* de Man 1907
Gonad ♀ reflexed
Spinneret absent; phasmids present
Cardiac bulb ±glandular, not valvate; median swelling often present (*Odontopharynx* de Man 1912)
Card. bulb valvate, oes. cephaloboid; vagina directed forward, muscles heavy *Turbatrix* Peters 1927 (=*Anguillula* auctores)
Spinneret present; phasmids absent; amphid with internal pocket, usually small
Cephalic setae 0; papillae in 2 circlets; in soil and fresh water
Pharynx large, open, ±parallel-sided; spinneret terminal.....*Mononchus* Bast. 1865
Pharynx narrow, ±conoid; spinneret ventrad.....*Mononchulus* Cobb 1918
Cephalic setae present; papillae 1 circlet; marine or in brackish waters; Oncholaiminae
Demanian system absent
Ovary posterior; vulva 73–77%; gubernaculum none.....*Pseudoncholaimus* Kreis 1932
Ovary ant.; vulva 70–75%; gubernaculum pres.; spicula ±tail length..*Proöncholaimus* Micol. 1924
Demanian system present
Uvette and exit pores present.....*Metoncholaimus* Fil. 1918
Uvette ampulla-like, exit pores absent
Male with pre-anal appendicule.....*Oncholaimium* Cobb 1930
Male without pre-anal appendicule.....*Oncholaimus* Duj. 1845
Ovaries 2
Gonads ♀ outstretched; striae of rods, exc. laterally; amph. a slit....*Dicriconema* Steiner & Hoeppli 1926
Gonads ♀ reflexed
Habitat soil and fresh water (for alternative see next page)
Spinneret 0; anterior oesoph. (corpus) with or without non-valvate med. bulb; amph. round or oval
"Spear" none; dorsal onch. opposed by ventral tooth or ridge; ceph. set. 6–10...*Butlerius* Goodey 1929

"Spear" a minute prod between lips; cephalic setae 0 ..... *Demaniella* Steiner 1914
(=*Demania* Steiner 1914)
Spinneret present, exc. sometimes in Mononchus
Amphid spiral; pharynx ±conoid ..... *Nannonchus* Cobb 1913
Amphid circular or oval, often small, with internal pocket
Pharynx irregularly conoid; onchia small ..... *Trilobus* Bast. 1865
Pharynx not conoid; one or more onchia large
Lips thick; papillae 12, in 2 circlets; renette not known ..... *Mononchus* Bast. 1865
Lips thin; papillae 6, ceph. set. 10; renette pres., ampulla conspicuous ..... *Adoncholaimus* Fil. 1908
Habitat marine; spinneret usually present (for alternative see preceding page)
Cuticle annulated
Annules not resolvable into dots or rod-like elements
Head truncate; annules interrupted; ceph. set. 4; phar. ribs long., serrate .. *Rhabdotoderma* Marion 1870
Head rounded; annules plain; setae many, short, ±irregular on calvarium .... *Croconema* Cobb 1920
Annules of rod-like marks; pharynx cyatholaimoid, vestibule ribbed; amphid a transverse slit
Ceph. set. 4, labial papillae setose; annules plain laterally ..... *Dicriconema* Steiner & Hoeppli 1926
Ceph. set. 10; annules with V-shaped marks laterally, "basket-work" on neck .... *Rhips* Cobb 1920
Cuticle not annulated; striae if present very fine
Head with subcuticular calvarium; amphid with internal pocket; Enoplidae
Calvarium complex, ornate, long-conoid ..... *Thoracostoma* Marion 1870
Calvarium relatively simple, a band with undulating margins; glands lateral
Pharynx wide; lips with denticles; odontia present(?); nema 20–34 mm ... *Cylicolaimus* de Man 1889
Pharynx narrow, ±filled by onchia, dorsal largest; cervical setae many; nema 8–17 mm.
Odontia present; cephalic setae long ..... *Fiacra* Southern 1914
Odontia absent; cephalic setae short or medium ..... *Synonchus* Cobb 1894
(=*Jägerskiöldia* Fil. 1916)
Head without calvarium
Amphid spiral; pharynx small, irregularly conoid, vestibule ribbed ..... (*Chromaspirina* Fil. 1918)
(=*Mesodorus* Cobb 1920)
Amphid with internal pocket; pharynx large, open, squarish, ribbed vestibule absent
Pharynx not divided, walls ±thick; amph. small; excretory pore oft not at lips; Oncholaiminae
Demanian system present, with exit pores and developed uvette ..... *Adoncholaimus* Fil. 1918
Demanian system absent, or gonenteric duct only
Subventral onchia equal in size; amphidial opening longer than wide
Tail 33%, filiform, spinneret none; gubernaculum none ..... *Filoncholaimus* Fil. 1927
(=*Pseudoparoncholaimus* Kreis 1932)
Tail short, rounded; gubernaculum present ..... *Pontonema* Leidy 1855
(=*Paroncholaimus* Fil. 1916)
Subventral onchia unequal in size; pharynx depth twice its width or more
Cuticle not viscous; phar. bulb clavate; lip reg. set off by constriction .. *Steineriella* Allgen 1932
(=*Steineria* Ditlev. 1928)
Cuticle viscous; pharyngeal bulb none; nema under 3 mm.; tail 6–10%
Pharynx very deep, ±filled by subventral onch.; bursa present *Oncholaimellus* de Man 1890
Pharynx not over twice as deep as wide, not filled by onchium; bursa none
Dorsal wall of pharynx well developed ..... *Viscosia* (de Man) Fil. 1918
Dorsal wall of pharynx rudimentary, an extension of dorsal tooth .... *Meroviscosia* Kreis 1932
Pharynx 2–5 chambers, wall thin; amph. large; excretory pore oft at lips; large onch. subventral
Oesophageal bulbs 5–8, serial, contiguous
Amphidial opening transverse, slit-like; ♂ supplements eurystomoid ..... *Bolbella* Cobb 1920
Amphidial opening ±circular; ♂ an enchelid, supplements simple .. *Polygastrophora* de Man 1922
Oesophageal bulbs none
External amphid transverse, slit-like; pharynx usually ±square; caudal glands before anus
Denticles forming a broad mid-pharyngeal band; ♂ supplements simple ... *Thoönchus* Cobb 1920
Denticles in 1–3 rows; ♂ supplements complex, "fluked" ..... *Eurystomina* Fil. 1921
(=*Eurystoma* Marion 1870
=*Marionella* Cobb 1922)
External amphid round; pharynx deep; onch. spear-like, exc. Ditlevsenella; ♂ oft an enchelid
Anterior oesophagus narrower, lumen wide ..... *Calyptronema* Marion 1870
(=*Catalaimus* Cobb 1920)
Anterior oesophagus not differentiated
Large onchia 3 ..... *Fenestrolaimus* Fil. 1927
Large onchium 1, other onchia 2
The large onchium conoid; nema 4–6 mm ..... *Ditlevsenella* Fil. 1927
The large onchium long, slender, spear-like
Pharyngeal chambers behind vestibule 2; eyes 2 ..... *Dilaimus* Fil. 1927
(=*Amphistenus* Marion 1870)
Pharyngeal chambers behind vestibule more than 2
Chambers separated by 2–4 rings or by dots or denticles ..... *Symplocostoma* Bast. 1865
Chambers (first 2) separated by "commas"; rings 3; eyes 0 ..... *Symplocostomella* Micol. 1930

Wall of the Pharynx unarmed (for alternative see page 8)
Cavity not cylindroid nor prismoid, i.e. cavity conoid or irregular in long. section (for alt. see page 24)
Oesophagus with median or posterior bulb or swelling, or both (for alternative see next page)
Amphid not known or obscure
Female not known; spinneret present; cephalic setae present; nema 1% wide; marine
Cuticle with distinct, anastomosing annules; amphid a transverse slit.....(*Leptonemella* Cobb 1920)
Cuticle without annules; amphid minute, at lips.....(*Catanema* Cobb 1920)
Female known; spinneret none, exc. Dasylaimus
Ovaries 2, reflexed; wings present
Spinneret pres.;phar.denticulate;oes.without med.bulb;post.ovary undev.;marine *Dasylaimus* Cobb 1933
Spinneret 0; post. pharynx concave-cylind.; oes. with med. bulb; in sheep dung *Rhabditoides* Goodey 1929
Ovary 1
Gonad ♀ outstretched, anterior; cephalic setae 4.....*Walcherenia* de Man 1921
Gonad ♀ reflexed; cephalic setae 0 or minute
Spinneret present; pharynx denticulate; striae of dots; post. ovary undev.; marine *Dasylaimus* Cobb 1933
Spinneret 0; pharynx not denticulate; oesophagus cephaloboid; not marine
Probolae present; amphid at lips; in soil
Cephalic appendages in 2 circlets.....*Acrobeles* Linst. 1877
Cephalic appendages in 1 circlet.....*Cephalobus* Bast. 1865
(=*Acrobeloides* (Cobb) Steiner & Bührer 1933)
Probolae absent; cephalic appendages none or in 1 circlet
Pharyngeal wall a long. series of elements; onch. 0; vagina directed inward..*Panagrolaimus* Fuchs 1930
Pharyngeal wall not of serial elements; onch. oft pres.; vagina directed ±forward; Turbatricinae
Posterior pharynx closed; vulva ±75%; vagina less muscular; tail ±blunt....*Plectonchus* Fuchs 1930
Posterior pharynx ±open; vulva ±65%; vagina muscular; tail slender.....*Turbatrix* Peters 1927
(=*Anguillula* auctores)
Amphid known
External amphid not spiral, circular nor elliptical
Habitat not marine
Spinneret present; cephalic setae 4; in fresh water; '♀.....*Chronogaster* Cobb 1913
Spinneret none; ovaries 2
Tail setaceous, 19%;amph. semicirc.;oesoph. with med. bulb;vulva 21%;'♀' (*Aulolaimoides* Micol. 1915)
Tail not setaceous, 9–15%; amphid inconspicuous, small or slit-like
Med. oesoph. bulb confluent in front; post. phar. closed; in decaying matter; '♀'...(*Cheilobus* Cobb 1924)
(=*Rhabditophanes* Fuchs 1930)
Med. oesoph. bulb none; pharynx ovoid; wings 0; amphid a slit; in soil; ♀...*Monhystera* Bast. 1865
(=*M. dintheriana* de Man 1885)
Habitat marine; cephalic setae present; spinneret present
Ambulatory tubes forming ventral pre-anal sole; nema ±S-shape, narrowed in card. reg.; marine; '♀'
Oesoph. region hardly swollen; card. bulb faint; cerv. striae all alike..*Notochaetosoma* Irwin-Smith 1918
Oesoph. region swollen, ovoid; oesophageal bulbs 1 or 2; band of cervical striae accentuated, exc. Tristicochaeta falcatum
Ventral ambulatory adhesion tubes or setae in 2 rows.....*Drepanonema* Cobb 1933
(=*Chaetosoma* Clap. 1863)
Ventral ambulatory adhesion tubes or setae in 3 or 4 rows.....*Tristicochaeta* Panceri 1878
(=*Draconema* Cobb 1913)
Ambulatory tubes absent; nema not crooked, not narrowed in cardiac region
Amphid transverse; pharynx minute; annules plain; ceph. set. 10, jointed; ♂ only *Leptonemella* Cobb 1920
Amphid large, folded or shepherd's crook; pharynx obvious; ovaries outstretched
Pharynx 4–5%, heavy,tubular;amphid 4–50% body;ceph.set.4,subceph.12;♀ (*Pseudolella* Cobb 1920)
Pharynx under 2%, conoid, not heavy; cephalic setae large, long; odontia 6 or 12
Ovary 1, posterior; cephalic setae 6; odontia 12; vulva 15%.....(*Synodontium* Cobb 1920)
Ovaries 2; cephalic setae 4; odontia 6; vulva 45–67%
Tail clavate; nema shorter, stouter; amphid larger.....*Axonolaimus* de Man 1889
Tail conoid; nema long, slender; amphid smaller.....*Ascolaimus* Ditlev. 1919
(=*Bathylaimus* Ditlev. 1918)
External amphid spiral, circular or elliptical
Female not known
Habitat soil (possibly marine); spinneret present; amphid spiral; ceph. set. 0....(*Amphispira* Cobb 1920)
Habitat marine
Amphid multispire; wings 0; annules very fine
Pharyngeal bulb none; lip region not set off; head truncate-conoid; onch. 3, small *Alaimonema* Cobb 1920
Pharyngeal bulb present
Head cylindroid; lip region discoid, set off by constriction.....(*Choniolaimus* Ditlev. 1918)
Head hemispherical; lip region not discoid.....(*Amphispira* Cobb 1920)
Amphid circular or monospire; spinneret present
Nema cephalated, striae ceasing at constriction
Pharynx none; head ±spherical; amphid behind head; nema slender, 1.4%....*Cinctonema* Cobb 1920
Pharynx definite; head ±hemispherical; amphid on head; nema wider, 3.8% (*Micromicron* Cobb 1920)
Nema not cephalated
Annules strong, each of 8 tile-like elements; oesphagus compound.....*Dasynemella* Cobb 1933
(=*Dasynema* Cobb 1920)
Annules none; oesophagus not compound
Cephalic setae 8 or more; onchium minute; amphid minute, at lips.....*Catanema* Cobb 1920
Cephalic setae 4; onchia 0; amphid large, not at lips
Wing single; amphids on head, large, double, circular, joined dorsally.....*Antomicron* Cobb 1920
Wings 0; amphids behind head, not joined
Base pharynx faintly cuticularized, without ring; amphid circular.....*Monhysteriella* Kreis 1929
Base pharynx with cuticular ring, prongs 2, vertical; amphid monospire..*Cricolaimus* Southern 1914
Female known
Ovary 1 (for alternative see next page)
Gonad ♀ outstretched, anterior; amphid circular; striae 0, or fine and plain; wings 0
Pharynx ±quadrate; neck under 5%; crystalline bodies lateral; marine.....(*Crystallonema* Cobb 1920)
Pharynx long-conoid; neck 17%; spinneret present; in fresh water.....(*Monhystera* Bast. 1865)
(i.e. subg. *Monhystrella* Cobb 1918)
Gonad ♀ reflexed; cephalic setae 0 or minute

Spinneret present; striae of dots; phar. denticulate; post. ovary undev.; marine *Dasylaimus* Cobb 1933
Spinneret absent; pharynx not denticulate; not marine
Head with 6 biting odontia; amphid round; nema cephalated exc.
Teratocephalus palustris.....*Teratocephalus* de Man 1876
Head with entire or 3-parted lip region; amphid small, at lips; nema not cephalated, exc. Acrobeles insubricus
Probolae absent; cephalic appendages 0 or in 1 circlet.....*Panagrolaimus* Fuchs 1930
Probolae present; in soil
Cephalic appendages in 2 circlets.....*Acrobeles* Linst. 1877
Cephalic appendages in 1 circlet.....*Cephalobus* Bast. 1865
(=*Acrobeloides* (Cobb) Steiner & Bührer 1933)
Ovaries 2 (for alternative see preceding page)
Gonads ♀ outstretched
Amphid multispire; striae fine; pharynx small, cup-shaped
Male ventral pre-anal supplementary organs small.....(*Parasabatieria* de Man 1907)
Male supplementary organs none.....(*Sabatieria* de Rouville 1903)
Amphid circular
Pharynx obconoid, cutic. rings 1 or more; spinneret pres.; brackish soil...(*Desmolaimus* de Man 1880)
Pharynx without transverse cuticularized rings; spinneret present or not
Habitat not marine; cephalic setae 0
Spinneret present; head with 4 circular "warts"; in fresh water.....*Pseudochromadora* Daday 1901
Spinneret absent; head without "warts"; bursa present; in moss.....*Himatidiophila* Rahm 1925
Habitat marine; striae fine; cephalic setae present
The pharynx obconoid, with cylindroid vestibule
Base pharynx cuticularized; head ±cylindroid; cardiac bulb valvate...*Metalinhomoeus* de Man 1907
(cf. *Deltanema* Kreis 1929)
Base pharynx not cuticularized; head ±conoid; lips if everted knob-like *Cryptolaimus* Cobb 1933
The pharynx minute or none
Cardiac swelling not strongly developed; ceph. set. 8–10; nema not tapering *Linhomoeus* Bast. 1865
Cardiac bulb broad, valvate; ceph. set. 4; nema tapering, tail setaceous *Terschellingia* de Man 1888
Gonads ♀ reflexed
Habit parasitic, in insects; oesophagus without median bulb.....*Neoaplectana* Steiner 1929
Habit free-living
Spinneret absent; cephalic setae 0; in soil and fresh water
Nema cephalated, exc. T. palustris; lip reg. lobed, with 6 biting odontia..*Teratocephalus* de Man 1876
Nema not cephalated; lip region not lobate; bursa present.....*Himatidiophila* Rahm 1925
Spinneret present
Cephalic setae 0; head with 4 circular "warts"; in fresh water.....*Pseudochromadora* Daday 1901
Cephalic setae present; head without "warts"
Habitat fresh water or soil; amphid circular to monospiral.....*Plectus* Bast. 1865
Habitat marine
Lips 2, mouth a dorso-ventral slit; "pseudonchs" dorso-ventral ridges....(*Pseudonchus* Cobb 1920)
Lips more than 2, mouth not a slit; "pseudonchs" absent
Amphid multispire
Pharynx irregular, with tooth-like projections.....*Zalonema* Cobb 1920
Pharynx simply conoid, regular, without tooth-like projections
Head set off by absence of striae.....*Heterodesmodora* Micol. 1924
Head not set off; striae extending to lips; neck 6–7%; onchium minute.....*Spirina* Fil. 1918
(=*Spira* Bast. 1865)
Amphid circular or monospiral
The pharynx denticulate; post. ovary undev.; striae of dots; wings pres...(*Dasylaimus* Cobb 1933)
The pharynx not denticulate; both ovaries developed
Dorsal pharyngeal wall not thickened; amphid not at lips
Neck 14–21%; wings present; amphid long-oval; head set off by groove at 4 cephalic setae
Length of neck 14–16%; amphid large, ½ head-width back.....*Eutelolaimus* de Man 1922
Length of neck 21%; amphid 2 head-widths back.....*Aplectus* Cobb 1914
Neck under 7%; wings 0; amphid spiral
Nema 4–7 mm.; width 0.3–1%; phar. straight, closed, with pharyng. swelling *Laxus* Cobb 1894
Nema 2–4 mm.; width 1.5–4%; pharynx conoid, oft with small onchium.....*Spirina* Fil. 1918
(=*Spira* Bast. 1865)
Dorsal pharyng. wall thick, tooth-like; amph. monospire at lips; ceph. set. 4; renette far back
Oesoph. glands obscuring junct. of intest.; dorsal phar. element ±uniform *Onchium* Cobb 1920
Oesoph. glands not prominent; dorsal pharyng. element not uniformly thick, but heavy
Tooth-like thickening parallel to axis.....*Camacolaimus* de Man 1889
(=*Digitonchus* Cobb 1920
=*Acontiolaimus* Fil. 1918)
Tooth-like thickening bent outward from beginning of vestibule
Point of "onchium" single.....*Acmaeolaimus* Fil. 1918
Point of Y-shaped "onchium" duplex.....*Ypsilon* Cobb 1920
Oesophagus plain, i.e. without median or posterior bulb or swelling (for alternative see preceding page)
Amphid not known or obscure (for alternative see next page)
Female not known
Habitat marine; lip region discoid; odontia 6; ceph. set. 4; amphid small.....(*Stephanolaimus* Ditlev. 1918)
Habitat fresh water, marsh or sand
Hemispherical "cap" wider than neck, edge setose; phar. conoid; spinneret pres. *Diplolaimus* Linst. 1876
Hemispherical cap none; setae 0; spinneret 0; wings double; bursa striate....*Macroposthonia* de Man 1880
Female known; spinneret present
Ovary 1; marine
Gonad ♀ reflexed; ceph. set. 0, pharynx denticulate; post. ovary undev.; wings pres. *Dasylaimus* Cobb 1933
Gonad ♀ outstretched; cephalic setae 4
The ovary anterior; nema 3 mm.; neck 12%; vulva 75%.....*Krampia* Ditlev. 1922
The ovary posterior; nema 1 mm.; neck 19%; vulva 35%.....*Asymmetrica* Kreis 1929
Ovaries 2, reflexed
Habitat fresh water (for alternative see next page)
Lips 3, rounded; pharynx small, closed; onchium minute, deepset.....(*Tripyla* Bast. 1865)
(=*Promononchus* Micol. 1923)

Lips 6, thin; pharynx larger, domed; onchia in posterior chamber ..... (*Trilobus* Bast. 1865)
Habitat marine (for alternative see preceding page)
Wings conspic.; striae of dots; ceph. set. 0; pharynx denticulate; post.ovary undev.. *Dasylaimus* Cobb 1933
Wings 0, striae plain, not altered laterally; cephalic setae present; Enoplidae
Calvarium elaborate, ornate; onchia often present..... *Deontostoma* Fil. 1916
Calvarium not elaborate, sometimes absent
Oesophagus crenate towards base; calvarium simple or reduced
Eyes 0; neck ±tapering; calvarium reduced; cervical setae in several rows.... *Stenolaimus* Marion 1870
Eyes with lenses
Pharynx simple; calvarium reduced; neck tapering..... *Nasinema* Fil. 1927
Pharynx with tooth-like processes; calvarium simple; neck ±cylindroid.... *Phanoderma* Bast. 1865 (=*Heterocephalus* Marion 1870)
Oesophagus not crenate; calvarium absent
Jaws 3, without mandibles or onchia..... (*Parenoplus* Fil. 1927)
Jaws absent
The pharynx tapering into oesophagus; cephalic setae 6, cervical small.. *Parozystomina* Micol. 1924
The pharynx broad,thin-walled,base truncate with mound;amph.with pocket *Pelagonema* Cobb 1894 (cf. *Vasculonema* Kreis 1928)

Amphid known (for alternative see preceding page)
External amphid not spiral, circular nor elliptical; female known
Ovary 1; amphid not linear
Gonad ♀ outstretched; lips 6, thin, each with 3 parallel-sided cutic. ribs; marine *Daptonema* Cobb 1920 (cf. *Theristus* Bast. 1865)
Gonad ♀ reflexed
The ovary posterior; spinneret absent; marine..... (*Rhabdocoma* Cobb 1920)
The ovary anterior, vulva 80%; spinneret present; soil about sugar cane..... *Trischistoma* Cobb 1913
Ovaries 2
Gonads ♀ outstretched; marine exc. Monhystera
Habitat soil among roots; amphid a transverse slit; pharynx ovoid..... *Monhystera* Bast. 1865 (=*M. dintheriana* de Man 1885)
Habitat marine
Amphid large, long-oval, on triangular plate, ±as wide as head; spinneret none.... *Didelta* Cobb 1920
Amphid not on special plate
Mouth ventrad of axis; amphid large, long, "folded'..... *Campylaimus* Cobb 1920
Mouth axial; amphid shorter
Odontia absent; amphid flattened, more or less reniform..... *Margonema* Cobb 1920
Odontia, if present, 6 or 12; amphid crook-shaped or "folded"
Tail clavate; body less slender; amphid larger..... *Axonolaimus* de Man 1889
Tail conoid; body slender; amphid smaller..... *Ascolaimus* Ditlev. 1919 (=*Bathylaimus* Ditlev. 1918)
Gonads ♀ reflexed
Habitat freshwater
Pharynx larger, domed; lips 6, thin; onchia small, in posterior pharynx..... (*Trilobus* Bast. 1865)
Pharynx small, closed; lips 3, rounded; onchium minute, deepset..... (*Tripyla* Bast. 1865) (=*Promononchus* Micol. 1923)
Habitat marine
Wings present; amphid a transverse slit almost as wide as head..... *Actinonema* Cobb 1920
Wings absent; amphid with internal pocket (Rhabdocoma ?); Enoplidae (Rhabdocoma ?)
Oesophagus crenate towards base
Pharynx without tooth-like processes; cervical setae in longitudinal rows... *Stenolaimus* Marion 1870
Pharynx with 2–3 forward-pointing tooth-like processes; calvarium pres... (*Phanoderma* Bast. 1865) (=*Heterocephalus* Marion 1870)
Oesophagus not crenate
Calvarium present; onchia often 1-3
The calvarium elaborate, ornate, relatively short..... *Deontostoma* Fil. 1916
The calvarium a mere band,margin wavy;external amphid transverse-oval *Cylicolaimus* de Man 1889
Calvarium absent
Lateral series of setae on neck absent; spinneret absent..... (*Rhabdocoma* Cobb 1920)
Lateral series of setae on neck of few members
Excretory pore on projection; pharynx definite, ±quadrate; testis 1.... *Paranticoma* Micol. 1930
Excretory pore not raised; pharynx ±conoid, often obscure; testes 2
Gubernaculum present; ♂ pre-anal ventral supplementary organ tubular *Anticoma* Bast. 1865
Gubernaculum none; ♂ ventral pre-anal supplementary organ papilloid *Anticomopsis* Micol. 1930
External amphid spiral, circular or elliptical
Female not known; marine exc. Dintheria (for alternative see next page)
Spinneret none;ceph.set.4,long;amph.transverse-oval,⅔ head-width,open caudad *Dintheria* de Man 1921
Spinneret present (Neurella, Bognenia ?)
Nema broad, tapering from head to tail; wings 12–24; amphid spiral..... *Pteronium* Cobb 1933
Nema slender, not widest at head; wings none or few
Amphid multispire
Wing single; cephalic setae 4; amphid broad, of few winds; spinneret(?)..... *Neurella* Cobb 1920
Wings absent; striae not altered laterally
Onchia 3,at tops apophyses;ceph.set.papilloid;pharynx complex,bulb strong *Trogolaimus* Cobb 1920
Onchia 0; cephalic setae longer; lips flap-like, at least distally
Lip supports thickened; phar. cyathiform; ♂ supplements many, chromadoroid *Dispira* Cobb 1933
Lip supports none; pharynx spheroid, on front of head; ♂ supplements 0.. *Dispirella* Cobb 1933
Amphid circular, elliptical or monospiral
Wings strong; amphid circular or monospiral
Oesoph.compound,wide anteriorly,card.bulb faint;amph.spiral;annules wide *Dasynemella* Cobb 1933 (=*Dasynema* Cobb 1920)
Oesoph. not compound; amphid circular
The wings 12, of spine-like markings..... *Xenolaimus* Cobb 1920
The wing single, with subordinate lines; amphids joined dorsally..... (*Antomicron* Cobb 1920)
Wings 0; striae not altered laterally
Onchium ±spear-like; cephalic setae 10; cephalic cuticle thickened; eyes 2 (*Cophonchus* Cobb 1920)
Onchium none (Nudolaimus ?)

Nema 9–10 mm.; striae 0; pharyngeal walls heavily cuticularized; amphid small
Amphid labial, spiral; phar. large, processes basal; ceph. set. 4; eyes 0...(*Nudolaimus* Allgen 1929)
Amphid 1 head-width back, oval; phar. small; ceph. set. 10; eyes 2...*Leptosomatides* Fil. 1918
Nema under 3 mm.; cephalic setae 4–6
Cephalic setae at least 2 head-widths long
Lip region discoid, set off; odontia 6; amphid small, oval.....*Stephanolaimus* Ditlev. 1918
Lip region not discoid; odontia none; amphid large, circular.....*Cenolaimus* Cobb 1933
Cephalic setae not over 1 head-width long; lip region not discoid; odontia 0
Pharynx a wide tube; head strongly conoid; width of nema 6%.....*Tubolaimus* Allgen 1929
Pharynx shallow; head not strongly conoid
Cuticle annulated; amphid oval, near lips; lips 3, massive, low.....*Zygonemella* Cobb 1920
Cuticle with fine striae or none; amph. circular, ±1 head-width back; lips ±confluent
Ribs of pharynx 6, cuticularized, parallel to axis.....*Rhadinema* Cobb 1920
Ribs of pharynx none; pharynx conoid.....*Bognenia* Allgen 1932
Female known (for alternative see preceding page)
Ovary 1; amphid not multispire
Gonad ♀ reflexed; amphid circular or elliptical
The ovary posterior; marine
Spinneret none; cephalic setae 4; tail usually about 40%.....*Rhabdocoma* Cobb 1920
Spinneret present; cephalic setae 0; tail about 3%.....*Nemanema* Cobb 1920
The ovary anterior; cephalic setae present (in Monhystrium sometimes papilloid)
Habitat not marine; spinneret present
Pharynx deep; onch. small, basal; lips massive, with flaps; vulva 80%; soil (*Trischistoma* Cobb 1913)
Pharynx less deep, vestibule definite; onchia 0; in gills of land crabs.....(*Monhystrium* Cobb 1920)
Habitat marine
Spinneret 0; ceph. set. 10; caudal setae thorn-like; amphid large, center raised (*Zanema* Cobb 1920)
Spinneret pres.; ceph. set. 4, small; thorn-like setae 0; phar. ±cylind..(*Conolaimella* Allgen 1930)
Gonad ♀ outstretched, anterior; usually marine
Spinneret none; wings 0; amphid circular; marine
Amphid large, with central mound; caudal setae thorn-like; nema 0.9% wide..(*Zanema* Cobb 1920)
Amphid not raised centrally; caudal setae if present not thorn-like
Labial palps 6; pharynx ±quadrate; tail conoid, 4%.....*Crystallonema* Cobb 1920
Labial palps 0; pharynx conoid then spheroid; tail long, filiform....(*Diplolaimella* Allgen 1929)
Spinneret present; marine exc. Monhystrium, and sometimes Monhystera and Theristus
Lips 3, each with finger-like odontium; striae coarse; wings 32, fewer towards tail *Xyala* Cobb 1920
Lips without finger-like processes; wings 0 or few
Mouth cavity large, complex, of several chambers, the first of radial elements; carnivorous
Base pharynx unsymmetrical,meeting oesoph.;middle chamber denticulate *Sphaerolaimus* Bast. 1865
Base pharynx symmetrical,oesoph.surrounding 2 chambers;dents.0 *Parasphaerolaimus* Ditlev. 1918
Mouth cavity smaller, of 1 or 2 chambers, walls relatively simple
Lips 6, conoid, twice high as broad, with hook-shaped set.; amph. monospire *Dactylaimus* Cobb 1920
Lips not as high as broad, without hook-shaped setae; mostly Monhysterinae
Caudal glands pre-anal, reaching vulva; excret. pore nr. phar.; ceph. set. 4 *Conolaimella* Allgen 1930
Caudal glands post-anal; excret. pore nr. nerve ring, when seen; ceph. set. oft many
Labial ribs 18, cuticularized, parallel-sided; testes 2.....*Daptonema* Cobb 1920
(cf. *Theristus* Bast. 1865)
Labial ribs absent or (Monhystrium) reduced;genera resembling Monhystera,exc.Sphaerocephalum
Margin of transverse-oval amphidial area not definite, sensory papilla at posterior margin
Intestine narrow, ½ body-width; gubernaculum tubular.....*Leptogastrella* Cobb 1920
Intestine wider(?); gubernaculum not tubular(?).....*Paramonhystera* (Steiner) Fil. 1918
Margin of amphidial area definite, sensory papilla not obvious
Habitat gills of land crabs; cephalic setae 10, sometimes papilloid.....*Monhystrium* Cobb 1920
Habitat aquatic; marine exc. sometimes Monhystera and Theristus
Pharynx conoid, then spheroid; striae fine or 0; eyes oft present..*Diplolaimella* Allgen 1929
Pharynx without spheroid chamber; amphid circular exc. Sphaerocephalum
Amphid monospire; neck 5–9%; spinneret wide, plug striated...*Sphaerocephalum* Fil. 1918
Amphid circular; neck 10–27%; spinneret without striated plug
Oesophagus wide in post. half; spicula hamate distally; gubernaculum 0 *Austronema* Cobb 1914
Oesophagus not wider posteriorly; gubernaculum present
Setae on head 8-fold; somatic set. oft long..*Steineria* (Micol.) Stekhoven & de Coninck 1933
Setae on head not 8-fold; long paired somatic setae absent
Gubernaculum tubular, barbed, apophysis none.....*Penzancia* (de Man) Fil. 1918
Gubernaculum not tubular
Spicula not much bent; gubernac. apophysate; mostly freshwater...*Monhystera* Bast. 1865
(=*Tachyhodites* Bast. 1865)
Spicula much bent or sickle-shape; gubernac. plate-like, dorsad.....*Theristus* Bast. 1865
(=*Allomonhystera* Micol. 1923)
(cf. *Daptonema* Cobb 1920)
Ovaries 2
Gonads ♀ outstretched; marine (for alternative see next page)
Nema 12–16% wide; neck "collared"; amphid spiral; wings many; spinneret present
Wings over 50; pharynx narrow; spicula 2, equal.....*Richtersia* Steiner 1916
Wings 16–20, in pairs; pharynx capacious, open; spicula unequal, or but 1....(*Richtersiella* Kreis 1929)
Nema under 3% wide; neck not "collared"; wings if present not numerous
Spinneret absent; amphid circular exc. Didelta
Setae none; amphid ±half as wide as head.....*Metalaimus* Kreis 1928
Setae present; amphid small exc. Didelta
Amphid very large, long-oval, on triangular plate; cephalic setae 4.....*Didelta* Cobb 1920
Amphid small, not on plate; cephalic setae 6 or more
Pharyngeal bulb distinct; cephalic setae 6, stout, jointed.....*Cytolaimium* Cobb 1920
Pharyngeal bulb none; setae on head 18, small; amph. with faint multispire..*Anticyathus* Cobb 1920
Spinneret present; cephalic setae present exc. Margonema
External amphid multispire
Male ventral pre-anal supplementary organs papilloid.....*Parasabatieria* de Man 1907
Male supplementary organs none.....*Sabatieria* de Rouville 1903
External amphid not multispire (Linhomoella faintly so)

Amphid wider than long, ±reniform; lips 3, double, with papillae.....*Margonema* Cobb 1920
Amphid circular or monospiral
Lips distinct, with distal flaps; ceph. set. 6, stout, jointed; papillae 6....*Cytolaimium* Cobb 1920
Lips absent or confluent
Oesoph.& lumen with oval enlargement behind eyes;eyes sometimes none *Araeolaimus* de Man 1888
Oesoph. without median enlargement; eyes 0; cephalic setae 6–10
Setae on head 10, shorter 4 specialized at tip; amph. faint multispire..(*Linhomoella* Cobb 1920)
Setae on head 6–8, without specialized tips; amphid circular.....*Linhomoeus* Bast. 1865
Gonads ♀ reflexed (for alternative see preceding page)
Habitat not marine exc. sometimes Aphanolaimus
Spinneret absent; amphid multispire; setae 0; striae of dots; in sand dunes..*Choanolaimus* de Man 1880
Spinneret present
Wings present; contour crenate; glands lateral, serial; amphid monospire..*Aphanolaimus* de Man 1880
Wings 0, striae not altered laterally; contour not crenate; amphid circular or oval
Lips, papillae & setae 0; amphid round; pharynx small, conoid, unarmed *Diplohystera* de Cillis 1917
Lips, papillae & small setae pres.; amph small, oval; phar. closed; onch. basal *Tripyla* Bast. 1865
(=*Promononchus* Micol. 1923)
Habitat marine
Amphid spiral; spinneret present
Pharynx with apophyses forward and backward from mid-region
Mid-pharyngeal region not denticulate; wings numerous, markings V-shaped....*Nunema* Cobb 1933
Mid-pharyngeal region denticulate.....*Halichoanolaimus* de Man 1886
(=*Smalsundia* Allgen 1929)
Pharynx without forward apophyses; mid-pharyngeal region not denticulate
Wings numerous; neck region "collared"; nema 12–16% wide
Spicula 2; wings over 50; pharynx narrow.....*Richtersia* Steiner 1916
Spicula unequal, or 1 only; wings 16–32; pharynx capacious, open.....(*Richtersiella* Kreis 1929)
Wings absent, striae if present not altered laterally
Jaws 3, with backward apophyses and numerous horny teeth anteriorly.....*Demonema* Cobb 1894
Jaws absent, pharynx without apophyses
Pharynx 2 chambers; ceph. set. 10, oft jointed, tips specialized; striae fine *Tripyloides* de Man 1886
Pharynx 1 chamber; tips setae unspecialized; striae less fine; eyes present
Cuticular pores none; pharynx with definite bulb.....*Nannolaimus* Cobb 1920
Cuticular pores present; pharynx without definite bulb.....*Cyatholaimus* Bast. 1865
(=*Necticonema* Marion 1870)
Amphid circular, elliptical or monospiral
Spinneret absent; cephalic setae 4, stout; tail usually ±40%.....*Rhabdocoma* Cobb 1920
Spinneret present
Oesophagus crenate towards base; calvarium reduced
Cervical setae in long. rows; pharynx ±none; ext. amph. ±semi-circular (*Stenolaimus* Marion 1870)
Cervical setae 0.....*Phanodermopsis* Ditlev. 1926
(=*Galeonema* Fil. 1927)
Oesophagus not crenate
Calvarium present; onchia often 1–3
The calvarium elaborate, ornate.....*Deontostoma* Fil. 1916
The calvarium a wavy band; often denticles at lips; amphid transverse..*Cylicolaimus* de Man 1889
Calvarium absent
Jaws 3, with simple supporting framework.....*Parenoplus* Fil. 1927
Jaws absent
Pharynx of 2 chambers
Chambers of pharynx ±equal, small; cephalic setae 0.....*Pseudopelagonema* Kreis 1932
Chambers of pharynx unequal, anterior large; setae 10, often jointed, tips specialized
Both chambers ±conoid or irregular in shape.....*Tripyloides* de Man 1886
Both chambers ±parallel-sided.....*Bathylaimus* Cobb 1894
(=*Macrolaimus* Ditlev. 1918
=*Cothonolaimus* Ditlev. 1919)
Pharynx of 1 chamber; setae without specialized tips
Dorsal pharyng. wall thick, tooth-like; amph. monospire at lips; ceph. set. 4; renette far back
Oesoph. glands obscuring junct. of intest.; dorsal phar. element ±uniform *Onchium* Cobb 1920
Oesoph. glands not prominent; dorsal pharyng. element not uniformly thick, but heavy
Tooth-like thickening parallel to axis.....*Camacolaimus* de Man 1889
(=*Digitonchus* Cobb 1920
=*Acontiolaimus* Fil. 1918)
Tooth-like thickening bent outward from beginning of vestibule
Point of "onchium" single.....*Acmaeolaimus* Fil. 1918
Point of Y-shaped "onchium" duplex.....*Ypsilon* Cobb 1920
Dorsal pharyngeal wall not thickened; amphid not at lips; Enoplidae, exc. Aphanolaimus
The pharynx open, capacious, walls usually heavily cuticularized; amphid with pocket
External amphid circular; wall of pharynx irregularly thick.....(*Pandolaimus* Allgen 1929)
External amphid small,transverse;pharyng.wall thin,base with mounds *Pelagonema* Cobb 1894
(cf. *Vasculonema* Kreis 1928)
The pharynx small or very narrow
Cervical setae absent; cephalic setae 4, in front of amphid.....*Aphanolaimus* de Man 1880
Cervical setae lateral, in short longitudinal series; amphid with pocket
Gubernaculum present; ♂ supplementary organ tubular.....*Anticoma* Bast. 1865
Gubernaculum none; ♂ supplementary organ papilloid.....*Anticomopsis* Micol. 1930

Cavity more or less cylindroid or prismoid, i.e. parallel-sided in long. section (for alt. see page 20)
Oesophagus with median or posterior bulb or swelling, or both (for alternative see page 27)
Amphid not known or obscure (for alternative see next page)
Female not known
Spinneret none;ceph.set.0;phar.closed;oesoph.cephaloboid;neck over 20%;in swamp *Litonema* Cobb 1920
Spinneret present; setae on head numerous; neck under 5%; amphid small, near lips; marine
Pharyngeal bulb present; striae none; length 3–4 mm.; onchia(?) 6, minute.....(*Catanema* Cobb 1920)
Pharyngeal bulb none; striae annulating the cuticle; length 10 mm.....(*Laxonema* Cobb 1920)
Female known; spinneret none exc. Rhabdolaimus; not marine; phasmids usually present

Ovary 1, anterior; cephalic setae 0 or minute
Gonad ♀ outstretched
Pharynx long, tubular, base halfway to nerve ring; spear none; median bulb 0 ..*Gymnolaimus* Cobb 1913
Pharynx base ±⅓ distance to nerve ring; spear reduced; oes. bulb strong (*Aphelenchoides* Fischer 1894)
(=*Seinura* Fuchs 1931
=*Parasitaphelenchus* Fuchs 1930
=*Pathoaphelenchus* (Cobb) Steiner 1931)
Gonad ♀ reflexed
Median oesophageal bulb present
Pharynx wide as long; cardiac bulb not valvate, median valvate; bursa none..*Lycolaimus* Rahm 1928
Pharynx much longer than wide; cardiac bulb valvate; bursa present.....*Rhabditis* Duj. 1845
(=*Diploscapteroides* Rahm 1928
=*Pseudorhabditis* Kreis 1929)
Median oesophageal bulb absent; in soil and fresh water
Cardiac swelling long, non-valvate; pharyng. rods heavily cuticular....*Diphtherophora* de Man 1880
(=*Chaolaimus* Cobb 1893
=*Archionchus* Cobb 1913)
Cardiac bulb valvate, preceded by isthmus, i.e. oesoph. cephaloboid; pharyng. rods none
Head end lobed by 6 large biting lips or odontia; carnivorous.....(*Teratocephalus* de Man 1876)
Head end not lobed, exc. in Acrobeles insubricus
Pharynx wall simple,forming 2 chambers;onchium oft present;ceph.set.0–4 *Macrolaimus* Maupas 1900
Pharynx wall of a longitudinal series of elements, i.e. cephaloboid
Probolae on head none.....*Panagrolaimus* Fuchs 1930
Probolae on head in 1 or 2 circlets
Circlets of probolae 2, elements often elaborate.....*Acrobeles* Linst. 1877
Circlet of probolae single.....*Cephalobus* Bast. 1865
(=*Acrobeloides* (Cobb) Steiner & Bührer 1933)
Ovaries 2; cephalic setae 0, exc. in Teratocephalus minute
Gonads ♀ outstretched; ceph. set. 0; phar. tubular, reaching oesoph. bulb; in soil *Aulolaimus* de Man 1880
Gonads ♀ reflexed
Spinneret present; wings absent; in fresh water and moist soil.....*Rhabdolaimus* de Man 1880
Spinneret absent
Cuticle with prominent tubercles; lip reg. set off by constrict.; ceph. set. with saccate bases
Tubercles encrusting dorsal surface; wings broad, thin; in moss.....*Craspedonema* Richters 1908
Tubercles in longitudinal row(s), right lateral; oesophagus rhabditoid.....*Bunonema* Jägerskiöld 1905
(=*Rhodolaimus* Fuchs 1930)
Cuticle without tubercles
Pharynx a long straight tube, ½ neck length or more
Oesoph. short, a muscular bulb only; ♂ supplements few, ventral, pre-anal *Aulolaimus* de Man 1880
Oesoph. long, of 2 parts; ♂ supplements paired, post-anal, i.e. diplogastroid
Male papillae 9 pairs; gubernaculum sigmoid; labial papillae 16.....*Myctolaimus* Cobb 1920
Male papillae 10 pairs; gubernaculum straight; bursal membrane narrow..*Cylindrogaster* Goodey 1927
Pharynx not a simple tube, much shorter
Oesophagus without median bulb
Cuticularized rods supporting pharynx; shed cuticle surrounding nema *Diphtherophora* de Man 1880
(=*Chaolaimus* Cobb 1893
=*Archionchus* Cobb 1913)
Cuticularized pharyngeal rods none
Head end lobed by 6 large biting lips or odontia; carnivorous.....(*Teratocephalus* de Man 1876)
Head end not lobed; bursa present.....*Rhabditis* Duj. 1845
Oesophagus with median and cardiac bulbs
Cardiac bulb valvate; median bulb well set off; glottoid apparatus present
Wall of pharynx cylindroid; bursa present; ♂ tail rhabditoid.....*Rhabditis* Duj. 1845
Wall of pharynx convex inward; bursa much reduced; ♂ tail long, spicate *Rhabditoides* Goodey 1929
(=*Rhabditella* (Cobb) Chitwood 1933)
Cardiac bulb without valve; median bulb valvate; ♂ tail setaceous, diplogastroid
Pharyng. rods 3, basal bulbs 2, stalked; tail 25–41%; long. striae fine.....*Tylopharynx* de Man 1876
Pharyng. bulbed supporting-rods none; Diplogasterinae
Nema with evident longitudinal striation.....*Diplogaster* M. Schultze 1857
Nema without longitudinal striation
Pharynx wide as deep, wall of several elements; ♂ papillae 0(?).....*Peronilaimus* Rahm 1928
Pharynx tubular, wall entire; ♂ papillae usually 5 pairs.....*Rhabditidoides* Rahm 1928
Amphid known (for alternative see preceding page)
External amphid not spiral, circular nor elliptical (for alternative see next page)
Habitat marine; cephalic setae and spinneret present; amphid crook-shaped, sometimes ±spiral
Ambulatory & somatic set. 0; nema not crooked, not narrowed in card. reg.; ventral arm amph. prolonged
Phar.wide,heavy,4–5%;amphid long,4–50% body;ceph.setae 4,subceph.12; ♀-...*Pseudolella* Cobb 1920
Phar.narrow,inconspic.;amph.under 2%;ceph.set.6,subceph.4;annules tiled; '♀' *Ceramonema* Cobb 1920
(cf. *Pselionema* Cobb 1933)
Ambulatory set. forming ventral pre-anal sole; nema ±S-shape, narrowed in card. reg.; marine; '♀'
Oesoph. region hardly swollen; card. bulb faint; cerv. striae all alike..*Notochaetosoma* Irwin-Smith 1918
Oesoph. region swollen, ovoid; oesophageal bulbs 1 or 2; band of cervical striae
accentuated, exc. Tristicochaeta falcatum
Ventral ambulatory adhesion tubes or setae in 2 rows.....*Drepanonema* Cobb 1933
(=*Chaetosoma* Clap. 1863)
Ventral ambulatory adhesion tubes or setae in 3 or 4 rows.....*Tristicochaeta* Panceri 1878
(=*Draconema* Cobb 1913)
Habitat not marine
Spinneret present; '♀', exc. Chronogaster
Lips 6, distinct, revolute; pharynx 9%; amphid semicircular; soil about cane roots *Anthonema* Cobb 1906
Lips not revolute; in fresh water
Cephalic setae 4; pharynx wider, under 1.5%; '♀.....*Chronogaster* Cobb 1913
Cephalic setae 0; pharynx long-tubular; tail 25–30%.....*Rhabdolaimus* de Man 1880
Spinneret absent; cephalic setae 0 or papilloid
Tail setaceous, 19%; oesoph. with 2 bulbs; amph. semicircular; vulva 21%; '♀' *Aulolaimoides* Micol. 1915
Tail not setaceous, under 15%; oesophagus without median bulb, exc. Cheilobus

Amphid transverse, curved, wide as head; phar. 7.6%; tail 2%; fresh water; ♂ only *Colpurella* Cobb 1920
Amphid inconspicuous, small or slit-like; tail over 9%; in soil or decaying material
Median oesoph. swelling before isthmus; cardiac bulb valvate; wings single; '♀'..*Cheilobus* Cobb 1924
(=*Rhabditophanes* Fuchs 1930)

Median oesoph. bulb absent
Pharynx closed; amphid a pore, with internal cuticularized tube; wings 2; J....*Litonema* Cobb 1920
Pharynx open, or with anterior open chamber; wings 0; ♂ only
Tail 15%, terminus setaceous; pharynx without cuticularized rods.....(*Monhystera* Bast. 1865)
(=*M. dintheriana* de Man 1885)
Tail 8%, conoid; cuticularized rods in pharynx; shed cuticle retained...*Diphtherophora* de Man 1880
(=*Chaolaimus* Cobb 1893
=*Archionchus* Cobb 1913)

External amphid spiral, circular or elliptical (for alternative see preceding page)
Female not known; spinneret present
Habitat soil; ceph. set. 0; ceph. cuticle thick, flaps doming vestibule; amph. spiral *Pycnolaimus* Cobb 1920
Habitat marine; cephalic setae present
Amphid multispire; annules not coarse; wings absent
Head cylindroid; lip reg. set off by constriction; pharyng. bulb present..(*Choniolaimus* Ditlev. 1918)
Head truncate-conoid; lip reg. not set off; pharyngeal bulb none; onch.3, minute *Alaimonema* Cobb 1920
Amphid circular, elliptical or monospiral
Wings 8; annules coarse; oesoph. to isthmus wide, muscular; card. swelling slight *Dasynemella* Cobb 1933
(=*Dasynema* Cobb 1920)

Wings 0
Cutilarized pharyng. ring basal; ceph. set. 4; ♂ supplements tubular, 14....*Cricolaimus* Southern 1914
Cuticularized pharyngeal ring none
Spiculum 1, gubernaculum absent; cephalic setae 10; amphid large, oval..*Pelagonemella* Kreis 1932
Spicula 2, gubernaculum present (Chloronemella ?); cephalic setae in circlets of 4
Striae coarse; amphid minute; length 10 mm.; width 0.8%.....*Laxonema* Cobb 1920
Striae fine; length under 4 mm.
Pharyngeal bulb present; amphid at lips; onchia 6, minute.....*Catanema* Cobb 1920
Pharyngeal bulb none; amphid behind pharynx; onchia 0.....*Chloronemella* Allgen 1929
Female known
Ovary 1
Gonad ♀ outstretched, anterior; amphid circular; wings absent
Spinneret present; pharynx long-conoid; neck 17%; in fresh water.....*Monhystera* Bast. 1865
(i.e. subg. *Monhystrella* Cobb 1918)

Spinneret absent; neck not over 5%; marine
Pharynx wide as deep; cardiac swelling faint, elongate; intestine not dark..*Crystallonema* Cobb 1920
Pharynx tubular; posterior ¼–⅓ oesoph. a massive bulb; intestine dark colored (Solenolaimus ?)
Cephalic setae minute; neck 1.4%; anterior oesoph. fusiform; tail rounded..*Solenolaimus* Cobb 1894
Cephalic setae often as long as mitreform head is wide; neck 2–5%
Anterior oesoph. not fusiform; pharynx not evertible; ♂ supplements 0....*Chromagaster* Cobb 1894
Anterior oesoph. fusiform; phar. "spear" evertible; ♂ supplements pres..*Siphonolaimus* de Man 1893
Gonad ♀ reflexed; wings often present; not marine exc. rarely Rhabditis
The ovary posterior, vulva 21%; med. bulb not valvate; amph. semicirc.; mud..*Aulolaimoides* Micol. 1915
The ovary anterior
Spinneret pres.; ceph. set. 4; card. bulb 0 or faint; amph. monospire; freshwater (*Anonchus* Cobb 1913)
Spinneret none; setae none, cephalic papillae sometimes setose
Oesophageal bulbs median and cardiac; pharynx simple; setae 0
Cardiac bulb valvate; amphid at lips, obscure; wings & bursa pres.; ubiquitous *Rhabditis* Duj. 1845
Cardiac bulb not valvate, median valvate; amph. transverse-oval, not at lips; phar. cylindroid
Dorsal onchium none; bursa present; ectoparasitic on beetle borer.....*Rhabditolaimus* Fuchs 1915
Dorsal onch. small, deepset; bursa 0; in exudate chestnut blight..(*Diplogasteroides* de Man 1912)
Oesophageal bulb cardiac only, preceded by isthmus; phar. of serial plates; bursa 0 or reduced
Head with 6 large odontia; amphid not obscure, often large
Nema mostly cephalated; cirri 0; amphid circular; soil & fresh water..*Teratocephalus* de Man 1876
Nema not cephalated; cirri 6; amph. transverse-oval; tail hooked; in bark *Chambersiella* Cobb 1920
(=*Diastolaimus* Rahm 1928)
Head entire or 3-parted at lips; nema not cephalated, exc. Acrobeles insubricus; amph. small
Probolae absent; onchium 0, or 1 inward-pointing.....*Macrolaimus* Maupas 1900
Probolae on head in 1 or 2 circlets
Circlets of probolae 2, labial and cephalic; amphid a pore near lips.....(*Acrobeles* Linst. 1877)
Circlet of probolae single; amphid often obscure.....*Cephalobus* Bast. 1865
(=*Acrobeloides* (Cobb) Steiner & Bührer 1933)

Ovaries 2
Gonads ♀ outstretched; cephalic setae present; marine or in brackish soil
Amphid multispire; cephalic setae 10, unequal
Cardiac bulb ellipsoid; 6 of ceph. set. short; subcephalic setae 4; tail 30%, fine..*Laimella* Cobb 1920
Cardiac bulb slight; 4 of ceph. set. short, tips specialized; tail 7%.....(*Linhomoella* Cobb 1920)
Amphid circular or monospiral; tail not over 18%, not setaceous
Gland ducts cuticularized, piercing cuticle, ventrad, cerv. & pre-anal..*Halaphanolaimus* Southern 1914
Gland ducts and pores absent; pharynx minute or none
Pharynx ±none; ceph. set. 10, 4 short, tips specialized; tail 7%.....(*Linhomoella* Cobb 1920)
Pharynx obconoid, when open ½–⅔ as wide as head; spinneret sometimes present
Cuticularized rings in pharynx 1–3; neck 8–14%; marine & brackish soil (*Desmolaimus* de Man 1880)
Cuticularized pharyngeal rings absent; ventriculus present; marine
Base pharynx not cuticularized; cardiac bulb oft valvate; head ±conoid *Cryptolaimus* Cobb 1933
Base pharynx cuticularized; cardiac bulb valvate; head ±cylindroid *Metalinhomoeus* de Man 1907
(cf. *Deltanema* Kreis 1929)

Gonads ♀ reflexed
Habitat not marine, exc. rarely Rhabditis and Haliplectus (for alternative see next page)
Oesophageal bulbs median and cardiac; cephalic setae 0; pharynx ±tubular (for alt. see next page)
Vulva 21%; anus 81%; amph. semicirc., ⅓ head-width; wings & bursa none (*Aulolaimoides* Micol. 1915)
Vulva 40–94%; in soil etc., in fresh water, and marine
Spinneret pres.; amph. monospire, protruding; wings & bursa 0; pores lateral..*Haliplectus* Cobb 1913

Spinneret none; cardiac bulb valvate; amphid obscure; wings and bursa present *Rhabditis* Duj. 1845
Oesophageal bulb cardiac only (for alternative see preceding page)
Spinneret absent; amphid circular, elliptical or monospiral
Head without odontia; nema not cephalated; setae 0; spear minute; in soil (*Triplonchium* Cobb 1920)
Head with 6 large odontia; bursa none or much reduced
Nema mostly cephalated; cirri 0; amph. circular; in soil & fresh water. . . *Teratocephalus* de Man 1876
Nema not cephalated; cirri 6; amphid transverse-oval; tail hooked; in bark *Chambersiella* Cobb 1920
(=*Diastolaimus* Rahm 1928)
Spinneret present
Pharynx simple; oesophagus not plectoid; neck 15–20%
Cephalic setae 0; wings 0; pharynx long; amphid with pocket; tail 27% (*Rhabdolaimus* de Man 1880)
Cephalic setae 4; pharynx short; tail 15%
Wings present; amphid monospire. . . . . *Paraphanolaimus* Micol. 1923
Wings absent; amphid circular; onchium minute, not at lips. . . . . *Prodesmodora* Micol. 1923
Pharynx compound-elongate; oes. oft with isthmus to card. bulb (plectoid); wings pres.
Labial region not expanded; cephalic setae usually 4, sometimes 0 or 6; neck 12–30%
Cardiac bulb not valvate; pharynx long; neck 14–15%; in fresh water & mud *Paraplectus* Fil. 1930
Cardiac bulb valvate; amphid circular or transverse-oval. . . . . *Plectus* Bast. 1865
Labial region expanded, with complicated appendages; pharynx 4–9%; neck 27–31%
Lips 6, distinct, revolute; striae fine; amphid semicircular; pharynx 9% (*Anthonema* Cobb 1906)
Lips not revolute; head with dorso-ventral bladders; striae coarse; amph. round; phar. 3–6%
Cephalic appendages elaborately palmate. . . . . *Wilsonema* Cobb 1913
Cephalic appendages forming a closed, striated dome or cupola. . *Bitholinema* de Coninck 1931
Habitat marine or brackish (for alternative see preceding page)
Ambulatory set. forming a ventral sole, midbody to pre-anal; nema crooked; calvarium unstriated
Nema narrowest in card. reg., ±S-shaped; ambulatory set. hollow, pre-anal; annules finer
Oesoph. region hardly swollen; card. bulb faint; cerv. striae alike *Notochaetosoma* Irwin-Smith 1918
Oesoph. region swollen, ovoid; oesophageal bulbs 1 or 2; band of cervical striae accentuated, exc. Tristicochaeta falcatum
Ventral ambulatory adhesion tubes or setae in 2 rows. . . . . *Drepanonema* Cobb 1933
(=*Chaetosoma* Clap. 1863)
Ventral ambulatory adhesion tubes or setae in 3 or 4 rows. . . . . *Tristicochaeta* Panceri 1878
(=*Draconema* Cobb 1913)
Nema narrowest midway, epsilon-shaped; ambulatory setae not open at end; annules coarser
Sole apparently absent; amphid cresentic; annules 98. . . . . *Epsilonella* Steiner 1930
Sole present; amphid circular or monospiral
Oesophagus with median and cardiac bulbs. . . . . *Metepsilonema* Steiner 1927
Oesophagus with cardiac bulb only
Annules 80–112; ambulatory setae slender, falcate. . . . . *Bathyepsilonema* Steiner 1927
Annules 144–192; ambulatory setae straight or slightly arcuate
Body cylindroid, if crooked faintly so. . . . . *Archepsilonema* Steiner 1927
Body epsilon-like, i.e. body arches well developed
Cuticular annules homogeneous in structure. . . . . *Prochaetosoma* Baylis & Daubney 1926
(=*Rhabdogaster* Metsch. 1867)
Cuticular annules not homogeneous in structure
"Axial" part of the cuticular annules hollow ("frame rings"). . . . . *Epsilonema* Steiner 1927
"Axial" part of the cuticular annules vacuolated, etc. . . . . *Epsilonoides* Steiner 1931
Ambulatory setae 0; nema not crooked; calvarium absent, or not truncate-conoid
Lips 2, mouth a slit; amph. faint multispire; "pseudonchs" dorso-ventral ridges *Pseudonchus* Cobb 1920
Lips not 2, mouth not a slit; "pseudonchs" absent
Amphid multispire; neck 9–13%
Pharynx deeper than head width, wall irregular, with projections; striae plain *Zalonema* Cobb 1920
Pharynx tubular, less deep. wall straight; striae of dots. . . . . *Kreisia* Allgen 1929
Amphid circular, elliptical or monospiral; neck 14–25%, exc. Bolbonema 8%
Wings present; anterior end set off by groove at 4 ceph. set. & usually by lack of annulation
Neck 20–25%
Species marine; striae duplex; wings 2; phar. tubular, inconspic., prob. double *Aplectus* Cobb 1914
Species in brackish soil & marsh; lip reg. discoid; ceph. set. papilloid. . *Leptolaimus* de Man 1876
Neck 14–16%; marine
Gland ducts cuticularized, piercing cuticle, cerv. and pre-anal. . *Halaphanolaimus* Southern 1914
Gland ducts & pores 0; pharynx of several long chambers; amphid round *Polylaimium* Cobb 1920
Wings absent
Median bulb present; ceph. set. 0; amph. protruding: neck 12%; pores lateral *Haliplectus* Cobb 1913
Median bulb absent; pores none; marine
Nema cephalated by expansion opposite large monospiral amphid; neck 8% *Bolbonema* Cobb 1920
Nema not cephalated by expansion
Setae on head 6–10, long, flexible; neck under 5%; pharyngeal bulb present. . (*Laxus* Cobb 1894)
Setae on head 0–4; neck 6% or over; pharyngeal bulb absent
Head constricted at cephalic setae, not at amphid; amphid 2 head-widths back
Chambers of pharynx several, long; neck 10–11%; cephalic setae 0(?) *Polylaimium* Cobb 1920
Chamber of pharynx single; neck 19%; head conoid; cephalic set. 4 *Dermatolaimus* Steiner 1916
Head not constricted at setae; amphid near lips or not over 1 head-width back
Ceph. set. 0; phar. a tube reaching card. bulb; amphid conspicuous. . *Aegialoalaimus* de Man 1907
Ceph. set 4; pharynx shorter
Amphid small, monospiral, at lips; neck 19%; dorsal phar. wall thickened (*Onchium* Cobb 1920)
Amphid conspicuous, round, not at lips; neck 6%; phar. wall not thick. . *Linolaimus* Cobb 1933
Oesophagus plain, i.e. without median or posterior bulb or swelling (for alternative see page 24)
Amphid not known or obscure (for alternative see next page)
Female not known; marine (for alternative see next page)
Neck over 40%; amphid a long. slit; ceph. setae 4 or 8, fine; spinneret oft none. . (*Halalaimoides* Cobb 1933)
Neck 10–30%; amphid not longitudinal; spinneret present (Trileptium, Fimbriella ?)
Cephalic setae 0; onchia 3, awl-shaped, almost parallel to axis. . . . . (*Fimbrilla* Cobb 1905)
(=*Fimbria* Cobb 1894)
Cephalic setae 8 or more
Onchium dorsal, anterior, inward-pointing; neck 12%; nema 0.5% wide; amph. a slit (*Trileptium* Cobb 1923)
(=*Trilepta* Cobb 1920)
Onchium none; neck 22–30%; nema 2–3% wide; cephalic setae usually 8, in 2 circlets

Calvarium present; setae 8, near base of pharynx; eyes present.....*Gullmarnia* Allgen 1929
Calvarium absent; setae minute, around mouth; eyes 0; pharynx small, tubular..*Fimbriella* Allgen 1929
Female known (for alternative see preceding page)
Ovary 1, anterior
Ceph. set. 4; pharynx large, open; spinneret present; spicula 2-jointed(?); marine...*Filipjeva* Ditlev. 1928
Ceph. set. 0 or papilloid; pharynx none or narrow; spinneret usually none; ♀
Pharynx a tube reaching halfway to nerve ring; in soil.....*Gymnolaimus* Cobb 1913
Pharynx closed, or marked by reduced spear, not over ⅛ distance to nerve ring
Nema free-living, marine; spinneret doubtful; pharynx none or closed.....*Litotes* Cobb 1920
Nema parasitic in insects; spinneret 0; adult spear reduced, base 3-parted..(*Aphelenchulus* Cobb 1920)
Ovaries 2
Gonads ♀ outstretched; spinneret present; marine
The ovaries extending backward; winge 10–12; vulva 45%.....*Porocoma* Cobb 1920
The ovaries opposed; wings 0
Annules none or not coarse; amphid not saccate, far back; nema not wide....*Anoplostoma* Bütsch. 1874
Annules coarse; amphid saccate; nema wide; cephalic setae 4
Number annules ±17, secreted annules prominent, separated; head small..*Desmoscolex* Clap. 1863
Number annules 32–91, secreted annules 0; head concave-quadrate pyramidal..*Tricoma* Cobb 1894
(=*Quadricoma* Fil. 1922)
Gonads ♀ reflexed
Spinneret none; wings 0; pharynx 2.5–3%, tubular; tail rounded, under 2%; in soil..*Isolaimium* Cobb 1920
Spinneret present
Habitat freshwater; lips thick; pharynx closed; amphid small: onch. small, deepset (*Tripyla* Bast. 1865)
(=*Promononchus* Micol. 1923)
Habitat marine
Annules ±17,secreted annules prominent;amph.saccate;nema wide;ceph.set.4..*Desmoscolex* Clap. 1863
Annules none; amphid not saccate; nema less than 5% wide
Dorsal pharyngeal wall bent inward at lips,onchium-like;ceph.setae 10..(*Asymmetrella* Cobb 1920)
Dorsal pharyngeal wall not onchium-like; cephalic setae 0.....*Angustinema* Cobb 1933
Amphid known (for alternative see preceding page)
External amphid not spiral, circular nor elliptical (for alternative see next page)
Female not known; Enoplidae (Trileptium ?)
Head mitreform, set off by constriction; wings 6–8; spinneret doubtful; marine....*Xennella* Cobb 1920
Head not mitreform; spinneret often absent
Ceph. set. 0; ext. amph.wide,curved;phar.tubular,halfway to nerve ring;freshwater *Colpurella* Cobb 1920
Ceph. set. present; amphid small, or long and narrow; marine
Amphid narrow,many head-widths long;neck ±40%;ceph.set.4–8;tail setaceous *Halalaimoides* Cobb 1933
Amphid small, transverse-oval; neck 25% or less
Neck 25%;onchium none;ceph.setae 6,small,inconspicuous;spinneret present..*Vasculonema* Kreis 1928
(cf. *Pelagonema* Cobb 1894)
Neck 12%; onchium dorsal; cephalic setae 10, conspicuous; labial setae 6....*Trileptium* Cobb 1933
(=*Trilepta* Cobb 1920)
Female known
Ovary 1, anterior
Gonad ♀ outstretched;pharynx closed;ceph.set.papilloid;spinneret doubtful;marine..*Litotes* Cobb 1920
Gonad ♀ reflexed; spinneret present; external amphid a transverse slit, not at lips; not marine
Onchia 0; amphid far behind the ±quadrate pharynx; in fresh water.....*Prismatolaimus* de Man 1880
Onchium minute, deepset; amphid opposite pharynx; in soil about roots
Pharynx conoid when open; amphid opposite base of pharynx.....(*Trischistoma* Cobb 1913)
Pharynx a long tube, amphid opposite its anterior end, with pocket.....*Cryptonchus* Cobb 1913
(=*Dillevsenia* Micol. 1925)
Ovaries 2; marine exc. Monhystera
Gonads ♀ outstretched
Spinneret absent
Habitat marine; amphid long-oval, on large triangular plate.....*Didelta* Cobb 1920
Habitat not marine; amphid a transverse slit; in soil about roots.....*Monhystera* Bast. 1865
(=*M. dintheriana* de Man 1885)
Spinneret present
Mouth opening ±ventrad;wing duplex;amph.big,bent,dorsal arm the longer (*Campylaimus* Cobb 1920)
Mouth opening axial, terminal; wings none exc. sometimes Pseudolella
Annules coarse; amphid saccate; nema wide; cephalic setae 4
Number of annules ±17, secreted annules prominent, separated; head small..*Desmoscolex* Clap. 1863
Number of annules 32–91, secreted annules 0; head concave-quadrate pyramidal..*Tricoma* Cobb 1894
(=*Quadricoma* Fil. 1922)
Annules none, striae fine; amphid not saccate; nema slender
Amphid small, opening transverse with internal pocket, far back.....,(*Anoplostoma* Bütsch. 1874)
Amphid shepherd's crook, dorsal arm the longer
Length of amphid extreme, sometimes exceeding neck; eyes 0.....(*Pseudolella* Cobb 1920)
Length of amphid not over 1 head-width, loop-shaped; eyes 2, sometimes none
Oesophagus & lumen widened between eyes and nerve ring;pharynx obvious *Coinonema* Cobb 1920
Oesophagus & lumen not widened; pharynx like oesophagus...*Araeolaimoides* (de Man) Fil. 1918
Gonads ♀ reflexed
Spinneret absent; amphid with internal pocket
Cephalic setae 0; pharynx 2–3%, tubular; tail rounded, under 2%; in soil.....*Isolaimium* Cobb 1920
Cephalic setae 10, subcephalic many; marine.....*Platycomopsis* Ditlev. 1926
(=*Dactylonema* Fil. 1927)
Spinneret present
Habitat freshwater; amphid usually small or inconspicuous
Pharynx wide,domed by thin lips;onch.0;amph.transverse slit,far back..*Prismatolaimus* de Man 1880
Pharynx closed,lips thick;onch.minute,deepset;external amphid round or oval..(*Tripyla* Bast. 1865)
(=*Promononchus* Micol. 1923)
Habitat marine
Cephalic setae none or papilloid; external amphid narrow, transverse (for alt. see next page)
Amphid ⅔ head-width; cuticle ½ radius, annules coarse, markings rod-like..(*Actinonema* Cobb 1920)
Amphid ⅔ head-width or less, with internal pocket; cuticle less thick; phar. with lumen; Enoplidae
Eyes 2; protrusile pharyngeal ribs none.....*Illium* Cobb 1920

Eyes 0; protrusile pharyngeal ribs 3, straight.....*Fimbrilla* Cobb 1905
(=*Fimbria* Cobb 1894)
Cephalic setae present, not papilloid (for alternative see preceding page)
Amphid shepherd's crook
Annules not of tile-like elements.....*Parachromagaster* Allgen 1929
Annules coarse, each of 8 tile-like elements.....*Ceramonema* Cobb 1920
(cf. *Pselionema* Cobb 1933)
Amphid not shepherd's crook
Nema wide;annules ±17,secreted annules obvious;amph.saccate;ceph.set.4..*Desmoscolex* Clap. 1863
Nema slender, under 5%; amphid not saccate; annules 0, striae fine or 0; Enoplidae
Onchium dorsal; labial setae 0; cephalic setae 10, near lips
Tooth vestigial, on wall; external amphid a small slit; eyes 0.....(*Anoncholaimus* Cobb 1920)
Tooth a bending inward of dorsal pharyng.wall;amphid larger,faint..(*Asymmetrella* Cobb 1920)
Onchia none; labial setae 6, obvious; cephalic setae 10 or more, length 1–5 times head width
Pharynx narrow,closed;odontia (?) minute;ceph.set.3 times head width (*Tubolaimella* Cobb 1933)
Pharynx wide, open; odontia none
Lips 3, deep-cleft, with framework; ceph. set. 2–5 times head width.....*Chaetonema* Fil. 1927
Lips without framework; ceph. set. 1 head-width; excret. pore raised..(*Paranticoma* Micol. 1930)
External amphid spiral, circular or elliptical (for alternative see preceding page)
Female not known; spinneret present; marine
Nema wide, 14–32%, widest at lip region, tapering to terminus; wings numerous..*Pteronium* Cobb 1933
Nema slender, not over 5% wide, widest near middle
Amphid multispire; wings 0; cephalic & labial setae 18; labial framework present....*Dispira* Cobb 1933
Amphid circular, elliptical or monospiral
Odontia 2, large, lateral or subventral.....(*Diodontolaimus* Southern 1914)
Odontia absent(in Stephanolaimus 6 minute ?)
Onchium ventral; cephalic setae 10; amph. ½ head-width, with internal pocket..(*Isonemella* Cobb 1920)
Onchium absent (Nudolaimus ?)
Calvarium reduced to submed.plates;phar.large,wall strong,"onchia" basal..*Nudolaimus* Allgen 1929
Calvarium absent; cephalic setae present
Wings present; cephalic setae 6 or 10
Ceph. set. 6; wings 8; annules coarse, elements tile-like; oesoph. compound..*Dasynemella* Cobb 1933
(=*Dasynema* Cobb 1920)
Ceph. set. 10; wings 2; oesophagus simple; pharynx ±quadrate.....*Pulchranemella* Cobb 1933
Wings absent; cephalic setae 4–8
Lip region discoid, set off by constriction; odontia(?) 6.....*Stephanolaimus* Ditlev. 1918
Lip region not discoid; cephalic setae 4 or 6
Pharyng. vestibule with rod-like supports; head ±cylindroid; striae 0; ceph. set. 4
Rods 6, straight, parallel to body axis; cephalic setae 4, jointed.....*Rhadinema* Cobb 1920
Rods more than 6, curved, meeting axially.....*Eleutherolaimus* Fil. 1922
Pharyng. vestibule without supports; striae pres. exc. Vasculonema & Bathylaimella
Amphid transverse-oval, near lips; head slightly conoid; setae small
Setae labial, cephalic and subcephalic, minute.....*Zygonemella* Cobb 1920
Setae cephalic only, 6, small, inconspicuous.....*Vasculonema* Kreis 1928
(cf. *Pelagonema* Cobb 1894)
Amphid circular, near base of wide-tubular pharynx
Head cylindroid; setae on head 16, longest 4 times head width.....*Cenolaimus* Cobb 1933
Head conoid, narrowing 50% from base; setae on head 4, short
Cuticle striated; width (compressed ?) 6%.....*Tubolaimus* Allgen 1929
Cuticle not striated; width 3%.....*Bathylaimella* Allgen 1930
Female known
Ovary 1 (for alternative see next page)
Gonad ♀ reflexed
Amphid multispire; ovary posterior; pharynx linear; spinneret doubtful; marine *Alaimella* Cobb 1920
Amphid not multispire; ovary anterior
Spinneret none; amph. round, with central mound; caudal setae thorn-like, 2 rows (*Zanema* Cobb 1920)
Spinneret present; tail without thorn-like setae
Habitat marine; pharynx tubular; cephalic setae 4; nema ±2% wide.....(*Conolaimella* Allgen 1930)
Habitat not marine; pharynx open, not small nor narrow; nema 2–5% wide
Cephalic setae 4; pharynx with supporting pieces; amph. monospire; fresh-water *Anonchus* Cobb 1913
Cephalic setae 6 or 10, papilloid in Tripylium
Amphid monospire; in gills of land crabs.....(*Tripylium* Cobb 1920)
Amphid small, circular, transverse-oval or slit-like
Onchium 0; pharynx ±quadrate; amphid far back; in fresh water....*Prismatolaimus* de Man 1880
Onchium minute, deepset; pharynx conoid; amphid opp. pharynx; in soil (*Trischistoma* Cobb 1920)
Gonad ♀ outstretched
Habitat not marine
Spear minute; spinneret none; bursa present; parasitic in beetle.....(*Aphelenchulus* Cobb 1920)
Spear absent; bursa absent; in fresh water.....*Cylindrolaimus* de Man 1880
Habitat marine
The ovary posterior
External amphid multispire; pharynx linear; tail ±10%; spinneret doubtful (*Alaimella* Cobb 1920)
External amphid circular, pocket elongate; tail 34%; spinneret none.....*Halanonchus* Cobb 1920
The ovary anterior
Cephalic setae 4, papilloid; pharynx obscure, linear; amphid faint, open caudad....*Litotes* Cobb 1920
Cephalic setae not papilloid
Spinneret absent; labial appendages ("palps") present; amphid circular
Tail with 2 rows of thorn-like setae; amphid with distinct central mound.....*Zanema* Cobb 1920
Tail without thorn-like setae; amphid without mound; cardiac bulb faint *Crystallonema* Cobb 1920
Spinneret present; amphid circular or monospire
Pharynx 7%, tubular ,±halfway to nerve ring; head narrow; amphid far back *Rhynconema* Cobb 1920
Pharynx less than 2%, not a long tube
Depth of pharynx much greater than width, pharynx small
Oesophagus almost surrounding conoid pharynx.....*Conolaimella* Allgen 1930
Oesophagus meeting base of obconoid pharynx.....*Sphaerocephalum* Fil. 1918
Depth of pharynx not much greater than width, pharynx large, open

Amphid ±1 head-width; vulva 59%; caudal set. stiff, 8 prs.; post. ovary small *Halinema* Cobb 1920
Amphid ±½ head-width; vulva 80–85%; caudal set. 0; lips 6, conoid, separate
Labial setae 6, hook-shaped, on tips of lips; amphid spiral; in mud.....(*Dactylaimus* Cobb 1920)
Labial setae 6, not hook-shaped nor at tips; amphid round; cepb. set. 18..*Omicronema* Cobb 1920
Ovaries 2 (for alternative see preceding page)
Gonads ♀ outstretched; usually marine
Spinneret absent; marine exc. Pseudoaulolaimus
Habitat mud, rice fields; wings 16–32, fusing to 4 on 4-pronged tail....*Pseudoaulolaimus* Imamura 1931
Habitat marine
Amphid long oval, on wide triangular plate, almost as long as head is wide.....*Didelta* Cobb 1920
Amphid smaller, not on triangular plate
Cervical setae bunched; 2 flat setae in front of transverse-oval amphid.....(*Platycoma* Cobb 1894)
Cervical setae if present not bunched; amphid ±circular
Pharynx long, simple, tubular; cephalic setae 6.....*Southerniella* Allgen 1932
Pharynx minute; ceph. set. 18, minute, in 2 circlets; amphid faint multispire *Anticyathus* Cobb 1920
Spinneret present; marine exc. Cylindrolaimus
Habitat freshwater; ceph. set. 4; ovaries usually unequal; pharynx tubular *Cylindrolaimus* de Man 1880
Habitat marine
Annules few, coarse; amphid saccate; cephalic setae 4; nema wide
Number annules ±17, secreted annules prominent, separated; head small..*Desmoscolex* Clap. 1863
Number annules 32–91, secreted annules none; head concave-quadrate pyramidal *Tricoma* Cobb 1894
(=*Quadricoma* Fil. 1922)
Annules if present not few nor coarse; amphid not saccate
Gland ducts cuticularized, pores cervical & pre-anal; striae coarse.....*Halaphanolaimus* Southern 1914
Gland ducts and pores absent
Cephalic setae 10 or more
Pharynx with transverse cuticularized ring
Cavity of pharynx simple, capacious, ±cylindroid, ½ head-width....*Eumorpholaimus* Schulz 1932
Cavity of pharynx small, cup-shaped, rings sometimes 2 or more.....(*Linhomoeus* Bast. 1865)
(i.e. subg. *Paralinhomoeus* de Man 1907
=*Paradesmolaimus* Schulz 1932)
Pharynx without transverse cuticularized rings
Longest ceph. set. 4, total 16, tips simple;phar. quadrate;amph. ±neck-width *Halinema* Cobb 1920
Longest ceph. set. 6, 4 short specialized at tip; phar. 0(?); multispire faint *Linhomoella* Cobb 1920
Cephalic setae 4
Nema wide, 10–16%; wings numerous; neck region "collared"; amphid spiral; Richtersiinae
Wings ±50; pharynx narrow; spicula 2, equal.....*Richtersia* Steiner 1916
Wings 16–32; pharynx capacious, open; spicula unequal, or 1 only.....*Richtersiella* Kreis 1929
Nema slender, under 5%; wings if present not numerous
Eyes absent; amphid circular; pharynx truncate at base.....*Bathylaimella* Allgen 1930
Eyes often present; setae behind head usually long, numerous, conspicuous
Oesophagus lumen not enlarged; amphid loop-shaped.....(*Araeolaimoides* (de Man) Fil. 1918)
Oesophagus and lumen widened between eyes and nerve ring; pharynx obvious
Shape of amphid loop-like ("folded").....(*Cornonema* Cobb 1920)
Shape of amphid circular or monospiral; eyes sometimes absent(?)...*Araeolaimus* de Man 1888
Gonads ♀ reflexed
Spinneret absent; amphid circular, elliptical or monospiral
Habitat not marine; pharynx long, tubular, ±half as long as oesophagus
Wings 16–32, conspic., fusing to 4 on 4-pronged tail; in rice fields.....*Pseudoaulolaimus* Imamura 1931
Wings 0; end of tail not 4-parted; in soil.....*Isolaimium* Cobb 1920
Habitat marine; pharynx short
Pharynx narrow; amphid ±flattened, preceded by 2 flat setae.....*Platycoma* Cobb 1894
Pharynx 0 or linear; amphid transverse-oval, with pocket, 4 set. posterior..*Platycomopsis* Ditlev. 1926
(=*Dactylonema* Fil. 1927)
Spinneret present
Habitat freshwater
Mouth cavity absent or obscure, closed
Amphid monospire; gland cells lateral; ♂ supplements protrusile tubes..*Aphanolaimus* de Man 1880
Amphid circular or elliptical; ♂ supplements not protrusile.....*Tripyla* Bast. 1865
(=*Promononchus* Micol. 1923)
Mouth cavity definite, open, obvious
Pharynx narrow, compound; amphid monospire, ½ head-width; cephalic setae 4 *Paraplectus* Fil. 1930
Pharynx simple, i.e. of 1 chamber
The amphid small, transverse-oval or a slit; cephalic setae 6 or 10...*Prismatolaimus* de Man 1880
The amphid monospire, opp. pharynx; cepb. setae 4; gland cells lateral *Paraphanolaimus* Micol. 1923
Habitat marine
Nema wide, over 10%
Annules few, coarse; amphid saccate
Body setae not dense; secreted annules prominent, separate; head small..*Desmoscolex* Clap. 1863
Body setae dense, set along annules; junct. oesoph. & intestine indefinite...*Greeffiella* Cobb 1922
(=*Trichoderma* Greeff 1869)
Annules if present many; longitudinal ridges or wings 16–50; neck "collared"; Richtersiinae
Wings ±50; pharynx narrow; spicula 2, equal.....*Richtersia* Steiner 1916
Wings 16–32; pharynx wide, capacious; spicula unequal, or 1 only.....*Richtersiella* Kreis 1929
Nema slender, not over 5%
Calvarium present as a band or plates
Oesophagus not crenate; calvarium of plates; gland cells lateral.....*Cylicolaimus* de Man 1889
Oesophagus crenate; calvarium a band.....(*Phanodermopsis* Ditlev. 1926)
(=*Galeonema* Fil. 1927)
Calvarium absent
Gland ducts cuticularized, pores cervical & pre-anal; striae coarse..(*Halaphanolaimus* Southern 1914)
Gland ducts and pores none, or not cuticularized
Denticles mid-phar., apophyses forward & back; amph. multispire (*Halichoanolaimus* de Man 1886)
(=*Smalsundia* Allgen 1929)
Denticles none: amphid not multispire

Pharynx open, wide, ±capacious
Amphid round; anterior pharyng. chamber large, posterior small; setae 10 *Bathylaimus* Cobb 1894
(=*Macrolaimus* Ditlev. 1918
=*Cothonolaimus* Ditlev. 1919)
Amphid small, with internal pocket (Pandolaimus ?); pharynx of 1 chamber
Depth pharynx ±equalling width; dorsal onch. small, ant., appressed *Anoncholaimus* Cobb 1920
Depth pharynx nearly twice width
Wall of pharynx irregularly thick; amphid apparently circular.....*Pandolaimus* Allgen 1929
Wall of pharynx thin; amphid small, transverse-oval, with pocket....*Pelagonema* Cobb 1894
(cf. *Vasculonema* Kreis 1928)
Pharynx narrow, often tubular or with closed lumen
The amphid behind level of cephalic setae
Cephalic setae 0; pharynx ½ head-width, with 3 refractive elements...*Angustinema* Cobb 1933
Cephalic setae present
Nema over 3 mm. long.....*Cynura* Cobb 1920
Nema 0.6 mm. long.....*Aplectus* Cobb 1914
The amphid in front of level of cephalic setae; cephalic setae 4
Dorsal pharyng. wall not thicker; amphidial glands large, conspic.; eyes 2 ...*Ionema* Cobb 1920
Dorsal pharyng. wall thick, tooth-like; amph. monospire at lips; renette far back
Oesoph. glands obscuring junct. of intest.; dorsal phar. element uniform...*Onchium* Cobb 1920
Oesoph. glands not prominent; dorsal pharyng. element not uniformly thick, but heavy
Tooth-like thickening parallel to axis.....*Camacolaimus* de Man 1889
(=*Digitonchus* Cobb 1920
=*Acontiolaimus* Fil. 1918)
Tooth-like thickening bent outward from beginning of vestibule
Point of "onchium" single.....*Acmaeolaimus* Fil. 1918
Point of Y-shaped "onchium" duplex.....*Ypsilon* Cobb 1920

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Opuscula miscellanea nematologica, I. G. Steiner, U. S. Bureau of Plant Industry.

There will be published under this heading a series of observations on various nematodes and nematological problems resulting mostly from service work or observations of a more casual nature.

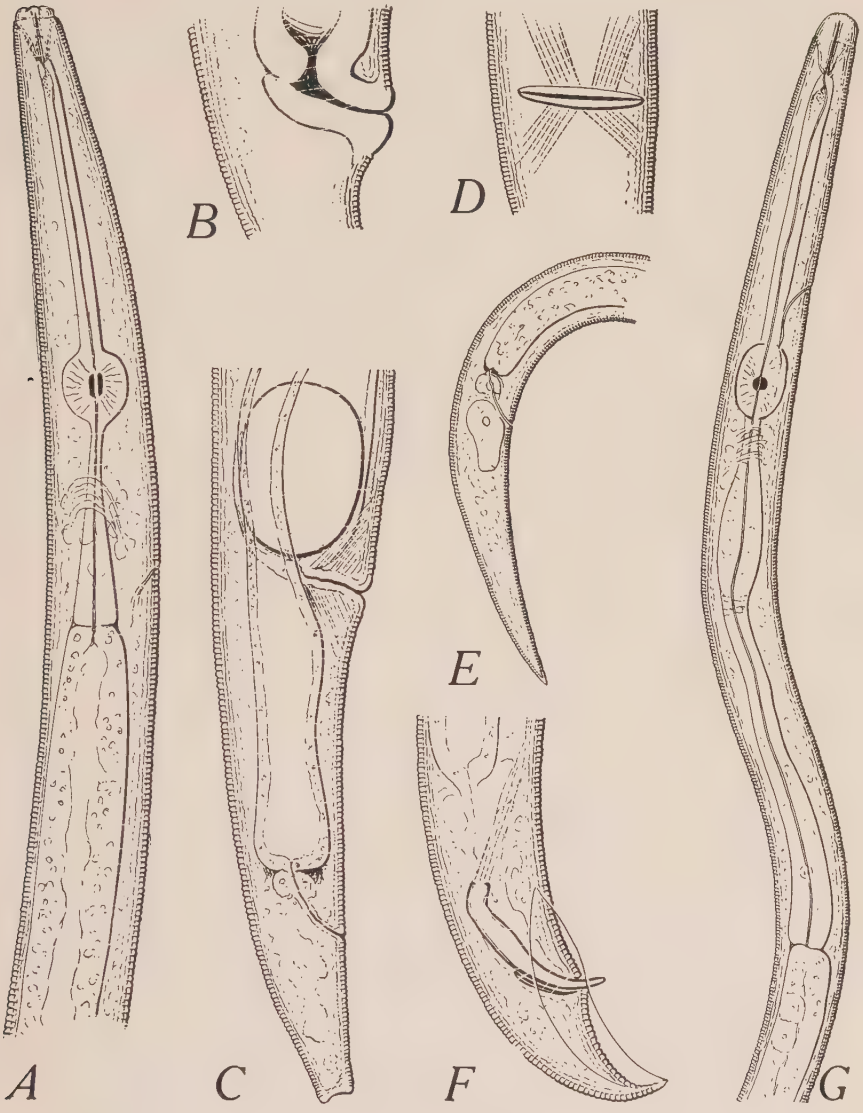

Fig. 1. *Anguillulina gallica*, n. sp.

A—Anterior end; about X 920. B—Vulva, vagina and portion of uterus; about X 1030. C—Posterio end of female with truncate terminus; about X 920. D—Face view of vulva, with dilatatores vaginae; about X 920. E—Tail end of second-stage larva; about X 1030. F—Tail end of male; about X 1030. G—Anterior end of second-stage larva; about X 1030.

(1) Anguillulina gallica, n. sp. (Fig. 1) living in burls of an elm (Ulmus sp.) from France.

Remarks.—This new species of *Anguillulina* is very close to *Anguillulina major* (Fuchs, 1915) amend. The elm burls in which the present species was observed exhibited no mines or other traces of insect activities. The nemas were found throughout the wood, which also harbored a fungus. Larval specimens were most numerous and would immediately swarm into the water when a piece of wood was immersed. This was not true of the adults, which had to be dissected out of the wood. It is thought that this species feeds on fungi.

Anguillulina major, according to Fuchs, is an associate of the bark beetle, *Ips typographus* L., in the mines of which it was observed. Larval specimens are carried under the wing covers of this beetle and apparently distributed to new trees. It is thought that in the present case a bark or woodboring beetle may also be involved as carrier, although apparently the nema migrates by itself through a tree to which it initially may have been transported by a beetle. It is not yet known if it merely follows the fungus in this migration through a tree, or if it is an agent in the spread of the fungus.

Description.—Larva: The difference in shape between the larval and adult tails, as observed by Fuchs in *A. major,* is also seen in the present species, where the larva has a pointed (fig. 1, E), the female an obtuse, and the male a bursate, tail end. In addition, the larva has an oesophagus of much greater length in relation to the total body length than the adult. The excretory pore of the larva lies in front of the middle oesophageal bulb, whereas in the adult it is located ventrad of the terminal oesophageal bulb. The posterior portion of the oesophagus of these larvae is of special interest because of its extraordinary length and form (fig. 1, G). The portion following the nerve ring is somewhat swollen and set off posteriorly from the end portion by a faint constriction. It is in this end portion that a large nucleus may be seen, which seemingly belongs to the dorsal oesophageal gland. *Adults:* Cuticle annulated. Two lateral membranes border a lateral field about 1/3 as wide as body. No cervical papillae nor phasmids seen. Tail of female short-conical, with broad-obtuse or even truncate terminus (fig. 1, C). Male tail short-conical; terminus pointed, curved ventrad, surrounded by bursa (fig. 1, F). Head differing from that of *A. major* by being distinctly set off, about half as long as wide, not annulated; lips distinct. Buccal stylet not very strong, with distinct yet very small basal knobs. Middle oesophageal bulb very prominent, with short valves and rather strong muscle fibers. Terminus of oesophagus indistinct, hardly set off from intestine; wall of latter consisting of double series of large cells. Vulva (fig. 1, B,C,D) a long transverse slit, occupying almost 3/4 of body diameter, with 4 dilatator muscles, as shown in figure 1, D. Vagina leads inward and forward; its walls thick. Uterus without a postvulvar branch. Eggs slightly oblong, almost spherical. Male bursa without ribs, surrounding tail end; spicula longer than tail, slightly curved, proximal end not capitate; gubernaculum lineate, slightly curved, about 1/3 as long as spicula.

Measurements.—♀: total length = 1. to 1.1 mm; $a = 34.8$; $\beta = 14.2$; $\gamma = 43.2$; v = 91.7%; ♂: total length, 0.63 to 0.97 mm; $a = 39\text{-}41$; $\beta = 11.8\text{-}12.2$; $\gamma = 37.2\text{-}38.8$.

Diagnosis.—Anguillulina resembling *A. major,* but differing in the following respects: Head distinctly set off; double lateral membrane; tail of female obtusely rounded or truncate, only 1/3 to 1/2 as long as distance from vulva to anus; uterus without postvulvar branch; spicula longer than male tail.

(2) Acrobeles glaphyrus, n. sp. (Fig. 2).

Remarks.—A single adult female of this apparently new species was found in a diseased tuber of *Polyanthes tuberosa*, the tuberose, which originated in Hermosillo, Sonora, Mexico, and was intercepted by Foreign Plant Quarantine officials at Nogales, Arizona (November 1934). The species resembles very closely *Acrobeles punctatus* Thorne, 1925. The intestine was filled from beginning to end with a brownish mass in which no particles could be distinguished, the whole rather suggesting jellied plant material as food of this species.

Description. — Body almost cylindrical, tapering less anteriorly, more rapidly posteriorly to a short concave conoid, sharply pointed tail. Annulation of cuticle very distinct, interrupted on the sides by three lateral membranes separating two non-annulated longitudinal fields, except on a portion of anterior end and on extremity of tail where annulation encompasses the body. Width of annules about 2μ. Width of entire lateral field about 2½ to 3 times width of an annule. Figure 2, A shows mode of ending of lateral field anteriorly and figure 2, D mode of ending posteriorly. In the region of the lateral fields especially on the tail, but also here and there on the annules, small points are seen in a subcuticular layer, irregularly arranged, not in 4 transverse series. Cervical papillae and phasmids not seen. Labial probolae with 2 outward curved prongs; cephalic probolae separated by deep incision, with short basal prong, flanked on each side by a larger inward curved prong. Cephalic papillae and amphids apparently on these cephalic probolae anterior to the annules, the papillae (only submedial ones were distinctly seen) forming low, rounded elevations, the amphidial opening apparently a curved transverse slit. Buccal armature as follows: cheilorhabdion short, thin; prorhabdions rather long, thin; only dorsal mesorhabdion present, thin, hardly separated from prorhabdion; metarhabdion short, thick, the dorsal with sharply pointed denticle; telorhabdion short, thick. Corpus and middle bulb of oesophagus hardly differentiated, thin, slender; terminal bulb relatively large, almost spherical, with well developed valvular apparatus. Excretory pore situated well cephalad, in the region of the corpus, far in front of nerve ring. Lips of vulva small. No details about female apparatus available.

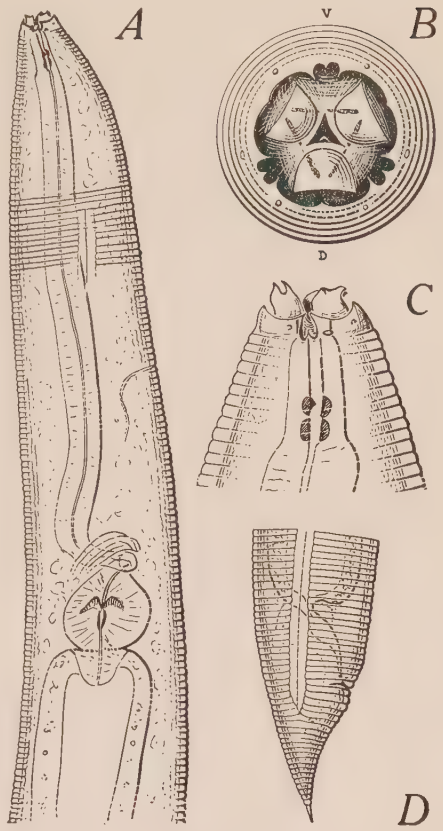

Fig. 2. *Acrobeles glaphyrus*, n. sp.

A—Anterior end; mode of formation and place of beginning of lateral membranes and lateral field are shown; about X 450. B—Front view of head (ventral side up); about X 1800. C—Head end, lateral view; about X 1800. D—Tail end of female; about X 450.

				14	32	
Measurements.—♀	5.1	23.	29.	59	94.6	.71 mm
	4.7	6.7	7.2	7.2	3.6	

$a = 13.8$; $\beta = 3.4$; $\gamma = 18.5$.

Diagnosis.—*Acrobeles* closely related to *A. punctatus* but different because of absence of dots on surface of annules; annules much smaller, in the region of the buccal cavity 9 instead of 5 as in *A. punctatus;* labial probolae with outward arching prongs; unannulated lateral fields with a central and 2 bordering membranes; excretory pore far in front of nerve ring.

Type locality.—Mexico (Sonora).

Type association.—Diseased tuberose bulb.

(3) Cephalobus maximus (Thorne, 1925) amend. (Fig. 3).

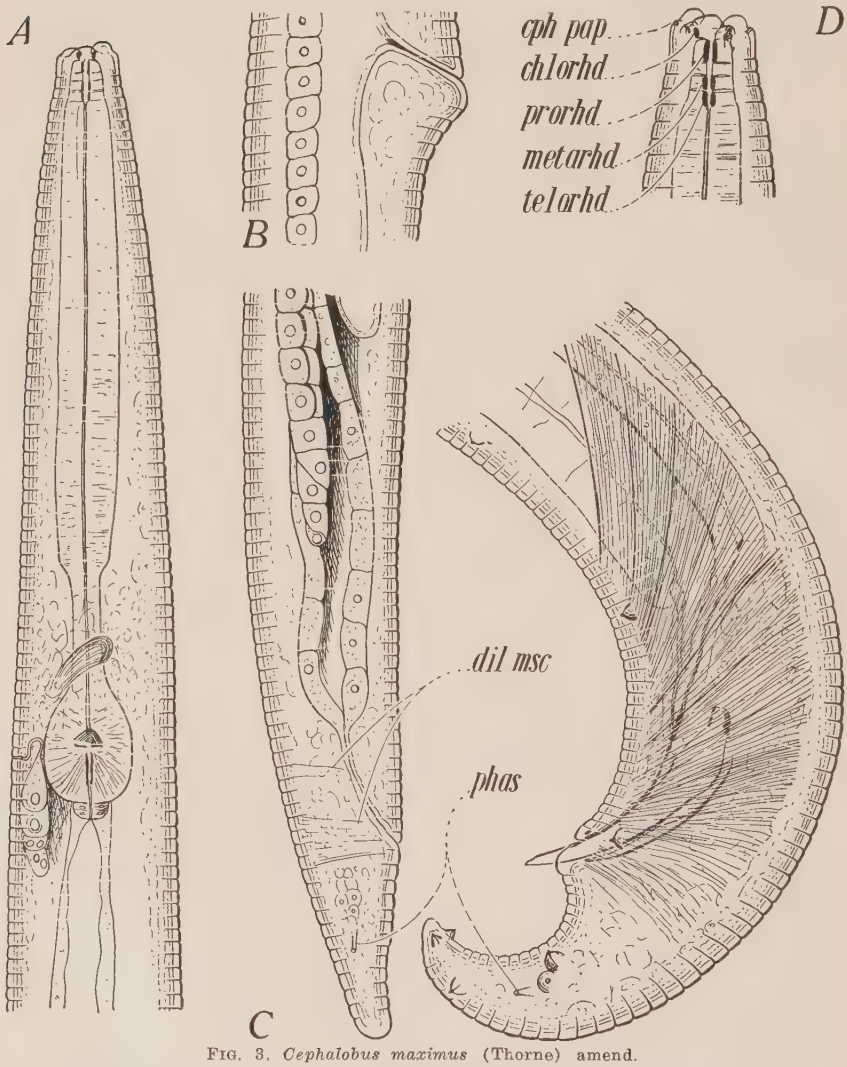

Fig. 3. *Cephalobus maximus* (Thorne) amend.

A—Anterior end; about X 640. B—Vulvar region; about X 640. C—Tail end of female; *dil msc,* dilator muscle of rectum and anus; *phas,* phasmid; about X 640. D—Head end; *cph pap,* cephalic papilla; *chlorhd,* cheilorhabdion; *prorhd,* prorhabdion; *mtarhd,* metarhabdion; *telorhd,* telorhabdion; about X 824. E—Male tail; *phas,* phasmid; about X 824.

Remarks.—Only the female of this large *Cephalobus* species has been known. Specimens (including a male) of what appeared to be this form were found in a bulb of *Iris xiphioides* from San Diego, California (April 1933). Associated with them were *Anguillulina dipsaci* (Kühn, 1857) Gerv. and v. Ben. 1859, *Aphelenchoides parietinus* (Bastian, 1865) Steiner, 1932, and *Acrobeles complexus* Thorne, 1915. Thorne's description of the female of *C. maximus* fits the present specimens fairly well. Most outstanding is the apparent absence of a pronounced middle bulbous swelling of the oesophagus. However, it is not thought that this is enough difference to warrant systematic separation of the present specimens from *C. maximus*. It is not our intention to furnish here a new description of this species, but a few additional characters will be mentioned. There are seemingly 2 submedial and 1 lateral cephalic papillae each. Amphids of the type characteristic of this genus were also seen. Of the buccal armature cheilo-, pro-, meta- and mesorhabdions are present (fig. 3, D). It is interesting to note that the excretory apparatus is composed of 4 cells, 2 larger and 2 smaller ones (fig. 3, A). The dilatator ani is divided into a smaller anterior muscle located about halfway on the rectum and a larger one placed just at the anal opening (fig. 3, C). The uterus of the female still has a posterior branch (fig. 3, B, C).

Description of the male.—Tail similar to that of female, but ventrally bent (fig. 3, E). Copulatory papillae as follows: One ventrosubmedial, a short distance in front of the spicula; 1 ventrosubmedial in latitude of anus; a pair in front of phasmid less than halfway down the tail (1 lateral and 1 ventrosubmedial); 1 dorsosubmedial at about the beginning of the last fourth of the tail, a lateral one and a ventral one close to terminus of tail. Copulatory muscles well developed, extending forward from anus almost 2½ body widths. Spicula slightly curved, distally pointed, widening proximad, but inner end again narrow, not capitate. Gubernaculum about 3/4 as long as spicula; distal half slightly swollen, proximal half linear. Testis reflexed.

Measurements.—♂: total length = 0.9 mm; $a = 27$; $\beta = 7.2$; $\gamma = 18$.

(4) On the synonymy of Anguillulina costata (de Man, 1921) Goodey, 1932, and Anguillulina cancellata (Cobb, 1925) Goodey, 1932.

Goodey (1932, J. Helminth. 10: 156) expressed the opinion that these 2 nemic species mentioned above were probably synonyms. The writer recently obtained a female specimen of what he considered to be *A. costata*. It was found on diseased rutabagas (*Brassica campestris*) and was associated with numerous specimens of *Anguillulina pratensis* (de Man, 1880) Goffart, 1929. The host plants came from Arlington Farm, Va., where the specimens originally described by Cobb as *A. cancellata* also were obtained. A careful study of our specimen and a detailed comparison of the description of *A. costata* as well as *A. cancellata* convince us that *A. cancellata* is the synonym of *A. costata*. It may be well to record that the length of the oesophagus as given in Cobb's measurement formula, i. e. 30% of the total length, is a misprint. As may be seen from the figure, this length is actually only 20% of the total length. Our specimen has the following dimensions:

$$♀ \frac{2.6 \quad 12. \quad 18. \quad {}^{36}\text{-}64. \quad 84.}{2.5 \quad 3.7 \quad 4.2 \quad 4.3 \quad 2.}$$ .47 mm or $a = 23.2$; $\beta = 5.4$; $\gamma = 6.4$.

Our specimen did not exhibit striae in the head cuticle. The number of longitudinal ridges on the cuticle was 18; they were all equidistant.

The nematode *Neotylenchus abulbosus* Steiner (Anguillulinidae) as a parasite of sugar-beets. Gerald Thorne and Charles Price, U. S. Bureau of Plant Industry (Salt Lake City, Utah).

Sugar-beets collected at Chino, California, July 16, 1934, were infested with *Neotylenchus abulbosus* Steiner, 1931. Injury consisted of variable-sized lesions covering considerable portions of the beets (fig. 4). In some instances the lesions extended practically through the root; at a depth of 3 inches the root of one beet had been completely severed. The nemas were found invading the living tissues while the dead portions were rapidly decaying and contained large numbers of the saprophytic nema, *Aphelenchus avenae* Bastian, 1865. The infested area covered several square rods and in it the beets were almost completely destroyed (fig. 5). Judging from the severity of the injury in this instance the nema may become an exceedingly destructive parasite if widely disseminated.

Fig. 4
Sugar-beet infested with *Neotylenchus abulbosus*. Cortex peeled off to give the lesions greater contrast.

Fig. 5
Sugar-beet field infested with *Neotylenchus abulbosus*. (Photograph by Charles Price, April 14, 1934.)

Notes on free-living and plant-parasitic nematodes, I. Gerald Thorne, U. S. Bureau of Plant Industry (Salt Lake City, Utah).

(1) *The occurrence of Diphtherophora perplexans Cobb, syn. Archionchus perplexans Cobb.*—In August 1923, a single specimen of *Diphtherophora perplexans* Cobb was collected near Provo, Utah. During the following 10 years dozens of soil samples from Utah fields were examined without the appearance

of another specimen. However in 1934 large numbers of this species appeared in several collections from widely separated points. In the fields at Salem and Lewiston, where mononch studies have been carried on for 10 years, many specimens of *D. perplexans* were present, the first seen from these fields. There is no apparent reason for this sudden increase in numbers when the population of many nemic species has been greatly reduced by a series of 6 years deficient in rainfall, of which 1934 was the driest. One other collection was made in 1930 in soil from a date garden, Indio, California.

(2) *The effect on nematodes of copper sulphate used in snail control.*—East Canyon Creek near Park City, Wasatch County, Utah, was treated with copper sulphate by Dr. L. E. Swanson, U. S. Bureau of Animal Industry. A concentration of 1:500,000 for 24 hours was used. Bank and bottom material was collected before and after treatment at 2 points about 150 feet and 2 miles respectively below the mixing station. At neither point was there any apparent effect on the nemic population. Species present were: *Dorylaimus stagnalis, D. consobrinus, Monhystera paludicola* (?), *Aphanolaimus aquaticus, Plectus cirratus, Trilobus pellucidus and Mononchus macrostoma.*

(3) *The taxonomic status of the nematode Tylenchorhynchus cylindricus Cobb, 1913.*—A reexamination of Cobb's original balsam mounts of *Tylenchorhynchus cylindricus* reveals the fact that this species actually is *Anguillulina dubia* (Bütschli, 1873) Goodey, 1932. Cobb's specimens differ only slightly from those described by Bütschli and deMan as *A. dubia.* Apparently such distinguishing characters as are mentioned in Cobb's description and figures were due to fixation distortion. For our present information *Tylenchorhynchus* is best considered a synonym of *Anguillulina* since it exhibits no separating characters.

A review of the fossil nematodes. A. L. Taylor.

Three short papers about fossil nematodes have been found in the literature. Two of these papers, both dealing with nematodes in amber, seem to have escaped the attention of most workers in helminthology.

The best known fossil nematode is *Mermis antiqua* reported by v. Heydon (1862, Paleontographica 10:62-82, pl. 10). It was found projecting from the anus of a beetle (*Hesthesis immortua* Heydon) from the Rhine lignite. The single specimen was about 25 mm long and is shown in v. Heydon's drawing in a much coiled position (fig. 6, A). Later writers have agreed that this is a nematode and not a gordiid, but it is impossible to be sure that it belongs to the genus *Mermis.* In view of this a new collective fossil genus *Heydonius* is proposed for it and other fossil mermithids. The name of this species becomes *Heydonius antiquus* (v. Heydon, 1862). The Rhine lignite was formed in the Eocene, the lowest division of the Tertiary.

Specimens in a better state of preservation have been reported from amber. As one report comes from Königsberg and the other from Danzig, both cities near the Baltic Sea, it is probable that the amber is from this vicinity and dates from the Lower Oligocene, the next to lowest division of the Tertiary.

H. v. Duisburg (1862, Schr. Königlichen Phys.-Okonom. Gesell. 3:31-36, pl. 1) reported 3 specimens. One of these, *Anguillula succini,* was found in a small piece of amber which also contained pollen grains similar to those of *Pinus sylvestris* L. Its description is as follows: Length 855μ, width 16μ at widest part (about 1/5 of length from head). Body width diminishes gradually from this point to the knob-like head and pointed tail. Body annulated, annules 2μ wide. Tail ventrally curved. A strand 1/3 to 1/4 the body width runs from head to a point shortly in front of tail—presumably remains of oesophagus and intestine. From the body shape, and other characters, it seems probable that this species belongs to the Plectidae, and the new collective fossil genus *Oligoplectus* is proposed to contain it and other fossil Plectidae. The name becomes *Oligoplectus succini* (v. Duisburg, 1862) (fig. 6, F).

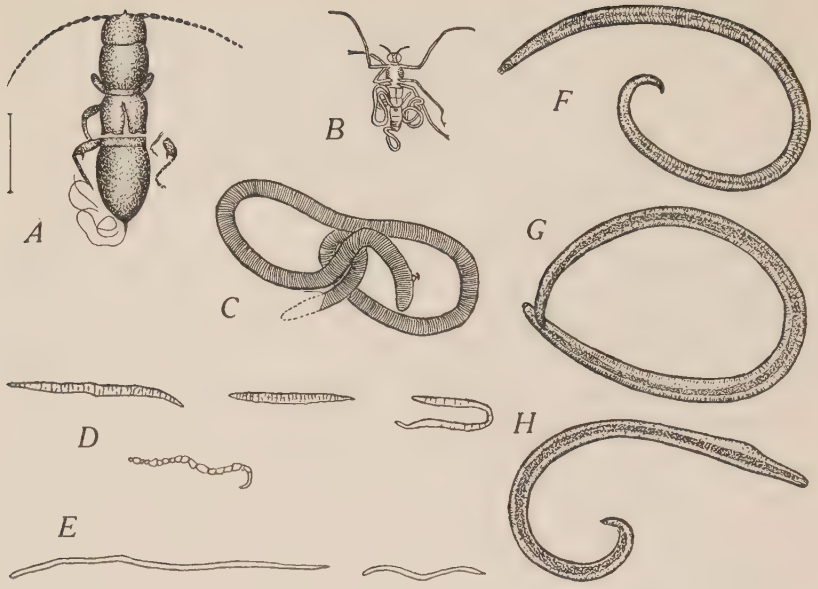

Fig. 6. Fossil nematodes.
A—*Heydonius antiquus* (v. Heydon, 1862). B-C—*Heydonius matutinus* (Menge, 1866). D—*Vetus pristinus* (Menge, 1866). E—*Vetus capillaceus* (Menge, 1866). F—*Oligoplectus succini* (v. Duisburg, 1862). G-H—*Vetus duisburgi*, n.g., n.sp. (A, redrawn from v. Heydon; B, C, D and E, redrawn from Menge; F, G and H, redrawn from v. Duisburg.)

Two other specimens were also included by v. Duisburg under the name *Anguillula succini*. They were found in a small piece of amber which contained the cast off cuticle of an unidentifiable insect but there is no evidence to show that this association is anything but accidental. As they are not congeric with the previous specimen, the genus *Vetus* is proposed as a new collective genus to contain these and other fossil free living species which cannot be identified to family. This species becomes *Vetus duisburgi* n.g., n. sp. The two specimens are described as follows: Lengths 850μ and 650μ. Body widths 18μ and 17μ respectively. Body fusiform, head rounded, tail bluntly pointed. Anterior portion of the smaller specimen evidently crushed and measures 23μ at widest part. Annules about 1μ wide on both specimens (figs. 6, G, H).

A. Menge (1866, Schr. Naturf. Gesell. Danzig v. 1, pt. 3-4) reported a number of specimens, also in amber from the Baltic. His first species, *Mermis matutina* Menge, 1866, is represented by 3 specimens associated with a chironomid (Diptera) (fig. 6, B). One of these is reported to have its head end between 2 segments of the abdomen of the insect, while the other 2 were coiled around and near it. Description: Length 3.5 mm, width 0.1 mm. Body cylindrical, bluntly pointed at head and tail. Color yellowish white, in life probably white or reddish white. Annules about 300. The only sign of internal organs is a cylindrical canal which does not run to the end of the body. The specimen which had its "head end" between the segments of the insect also had a protuberance near the other end from which 2 "spicules" projected. It seems probable that the worms were just leaving the host. If this assumption is correct, the "spicules" noted by Menge were on the wrong end of the worm, for mermithids leave the host head first. If we assume that the objects really were spicules and not some accidental bit of trash, the specimens would be excluded from the genus *Mermis* as we know it today, for *Mermis* has only 1 spicule. The annules observed by Menge were explained as postmortem changes due to the contraction of the longitudinal muscles. It seems quite possible that this could be the case.

As these specimens are probably mermithids, but not members of the genus *Mermis*, it is proposed that they be placed in the genus *Heydonius* to be known as *H. matutinus* (Menge, 1866).

Under the name *Anguillula pristina* Menge includes over 30 specimens of small, evidently free-living nematodes, contained in another piece of amber. The length is given as 139μ and the width as 3μ, but his drawings (fig. 6, D) show the specimens to be much thicker than these dimensions would indicate. Body fusiform, annulated and widest in front of the middle. Head rounded, tail pointed. Some specimens show remains of intestine. Some variation in size and annulation between individuals. Not enough description is given to determine the systematic position. It is proposed that these be included in the genus *Vetus* as *V. pristinus* (Menge, 1866).

The same author also describes about 50 nematodes in a third piece of amber under the name *Anguillula capillacea*. These vary in length from 0.7 to 2.0 mm and are 0.1 mm wide. Body cylindrical, head rounded, tail pointed. (Head and tail seem to be confused in the original description of both this and the other free-living species.) There is no trace of annulation. Here, also, not enough description is given to place the specimens in their proper systematic position, so it is proposed that these specimens be placed in the genus *Vetus* to be known as *V. capillaceus* (Menge, 1866) (fig. 6, E).

Thanks are due to Dr. R. S. Bassler, of the U. S. National Museum, for geological information and to Dr. B. G. Chitwood for help and the use of the drawing of *Heydonius antiquus*.

A new nematode, *Camacolaimus prytherchi*, n. sp. (Camacolaimidae).

B. G. Chitwood, U. S. Bureau of Animal Industry.

During the past summer the writer made numerous collections of marine nematodes while at the Bureau of Fisheries Laboratory, Beaufort, N. C. Representatives of most of the groups of marine nematodes were collected and are being used for anatomic study. Some of these appear to be new and are being described. The histology of the species described here will be published later.

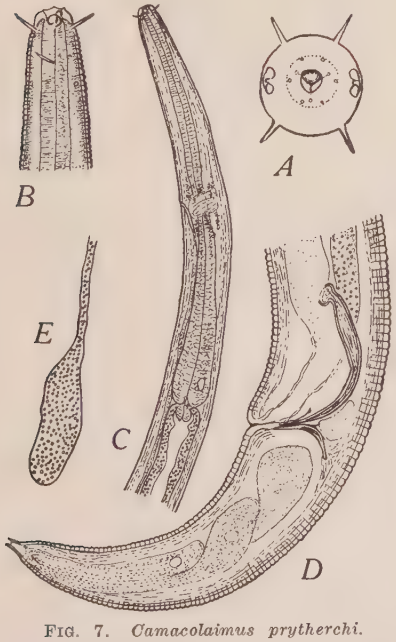

Fig. 7. *Camacolaimus prytherchi*.

A—Head, *en face* view. B—Head, lateral view. C—Esophageal region, lateral view. D—Tail of male, lateral view. E—Excretory cell.

Camacolaimus prytherchi, n. sp.

Description.—Oral opening subtriangular. Cephalic papillae consisting of 6 small papillae of internal circle and 4 setae of external circle (?dorsodorsals and ventroventrals). Dorsal tooth short, bluntly truncate. Cuticle striated; lateral alae present; sublateral somatic setae present. Excretory cell situated about 2/3 to 1 esophageal length from anterior end of body. Male 1.31 mm long; $a = 43$, $\beta = 5.9$, $\gamma = 13.1$. Testis extending to about 40 percent of body length from anterior extremity. Female 1.69 mm long; $a = 52$, $\beta = 8.45$, $\gamma = 19$. Vulva dividing body in proportions 52:48. Anterior ovary extending 280μ anteriad, reflexed; posterior ovary extending 180μ posteriad, reflexed. Mature eggs (in 1- to 2-cell stage 87μ long by 25μ wide; 1 to 2 present.

Habitat.—Beach sand, just below low tide mark.

Locality.—United States (Beaufort, N. C.).

Specimens.—U. S. N. M. Helm. Coll. No. 40501 (cotypes).

Camacolaimus prytherchi appears to be more closely related to *C. zostericola* (Filipjev, 1918) than to any of the other species of this genus, and differs from it in the dorsal tooth which is conical in *C. zostericola* and bluntly truncate in *C. prytherchi.*

Two new nematodes of the genus *Heth* Cobb, 1898 (Atractidae). M. B. Chitwood.

Two species of the genus *Heth* were found in a collection of nematodes from preserved specimens of millepeds in the U. S. National Museum. These appear to be new species, one being very similar to *Heth juli* Cobb, 1898 (Agric. Gaz. N. S. Wales 9:249, figs. 10, I-IV), the other similar to *Heth spinosum* Artigas, 1929 (? 1930, Systematica dos nematoideos dos arthropodes, These, São Paulo, pp. 81-83, pl. 32, fig. 1; pl. 33, fig. 1). Sexual dimorphism is so extreme in this group that it is difficult to be certain which males and females belong to the same species. Fortunately the males were found in the same collections as the females on several occasions and only one species of each in a collection. The new species are separated from previously described species by means of a key following the descriptions.

Heth dimorphum, n. sp.

Description.—Male 2.03 to 2.04 mm long by 90μ wide. Oral opening surrounded by an internal circle of 6 papillae and an external circle of 4 papillae; 3 feather-like structures projecting from stoma. Cuticular ornamentations absent. Esophagus 610 to 660μ long. Excretory pore not observed. Anus 260μ from posterior extremity; tail attenuated. Genital papillae consisting of at least 1 pair of preanal and at least 4 pairs of postanal papillae. Spicules 140 to 150μ long; nearly completely fused. Preanal organ vesiculate in lateral view, sucker-like in oblique view (fig. 8, D).

Female 2.28 to 4.22 mm long by 110 to 263μ wide. Head in form of 2 lateral lobes, each bearing 2 papillae of external circle and an amphid. Subcephalic collar laterally shield-like; 2 pairs (in tandem) of double postcephalic lateral spines. Esophagus 400 to 454μ long. Excretory pore not observed. Anus 45

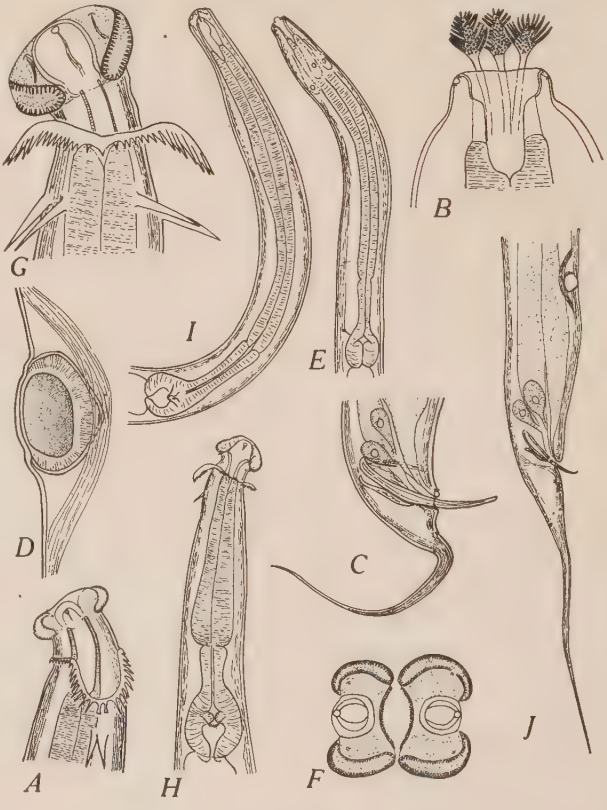

Fig. 8.

Heth dimorphum, n. sp. A—Head of female. B—Head of male. C—Tail of male. D—Preanal organ, slightly oblique view. E—Esophageal region of male. F—Head of female, *en face* view. *Heth hexaspinosum,* n. sp. G—Head of female. H—Esophageal region of female. I—Esophageal region of male. J—Tail of male. (All lateral views except as noted.)

to 67μ from posterior extremity; tail attenuated. Vulva 18 to 22μ anterior to anus; vagina directed anteriad; uteri parallel. Eggs 130 to 170μ long by 53 to 72μ wide.

Host.—Spirostreptus sp. (milleped).

Location.—Intestine.

Localities.—Sumatra (Kepahiang) (type locality); Philippine Islands (Mt. Makiling, Luzon).

Specimens.—U. S. N. M. Helm. Coll. Nos. 31636 (type) and 31640 (paratypes).

Heth hexaspinosum, n. sp.

Description.—Male 1.45 to 1.52 mm long by 82 to 91μ wide. Oral opening surrounded by internal circle of 6 papillae and an external circle of 4 papillae. Labial structures apparently absent, ornamentations absent. Esophagus 410 to 490μ long. Excretory pore 210μ from anterior extremity. Anus 298 to 306μ from posterior extremity; tail attenuated. Genital papillae consisting of 1 pair of adanal and 6 pairs of postanal papillae; phasmids lateral. Spicules 68 to 70μ long, nearly completely fused. Preanal organ vesiculate (fig. 8, J).

Female 1.82 to 2.07 mm long by 91 to 109μ wide. Head in form of 2 lateral lobes (fig. 8, G), each bearing 2 papillae of external circle and an amphid. Subcephalic collar not shield-like; 2 median and 4 submedian postcephalic spines. Esophagus 327 to 363μ long. Excretory pore 160μ from anterior extremity. Anus 500 to 545μ from posterior extremity; tail attenuated. Vulva 89 to 109μ anterior to anus; vagina directed anteriad, uteri parallel. Eggs 94 to 100μ long by 36 to 40μ wide.

Host.—Spirobolus sp. (milleped).

Location.—Intestine.

Type locality.—Panama (Upper Pequena River).

Specimens.—U. S. N. M. Helm. Coll. Nos. 31631 (type) and 31630 (paratypes).

Key to the species of the genus Heth

1. Subcephalic collar of female shield-like 2
   Subcephalic collar of female not shield-like 3
2. Female bearing 2 pairs (tandem) of lateral spines ..... *H. dimorphum*, n. sp.
   Female bearing 2 pairs (tandem) of lateral, distally bifid scales ..... *H. juli* Cobb, 1898
3. Female bearing 1 group of postcephalic spines (2 median, 4 submedian) ..... *H. hexaspinosum*, n. sp.
   Female bearing 3 groups (tandem) of postcephalic spines (2 in each group) 4
4. Postcephalic spines lateral ..... *H. duvidosum* Artigas, 1929
   Postcephalic spines median ..... *H. spinosum* Artigas, 1929

Nomenclatorial notes, I. B. G. Chitwood, U. S. Bureau of Animal Industry.

In the process of revising the classification of nematodes several cases have been found in which nomenclatorial corrections appear to be necessary. These corrections fall in 4 groups, as follows: (1) A case of priority involving the status of *Anguina* Scopoli, 1777, *Anguillulina* Gervais & Beneden, 1859, and *Tylenchus* Bastian, 1865; (2) renaming of homonyms; (3) emendation of supergeneric names; and (4) designation of type species. These subjects will be covered under separate headings.

(1) THE STATUS OF ANGUINA SCOPOLI, 1777

It appears that *Anguina* invalidates *Anguillulina* and *Tylenchus* as generic names for the wheat eelworm. The oldest generic name for this important nematode appears to be *Anguina* Scopoli, 1777, a name which Baylis and Daubney (1926, Synopsis fam. & gen. Nematoda, p. 65) have placed as a synonym of *Anguillulina* Gervais & Beneden, 1859 (= *Tylenchus* Bastian, 1865). Goodey (1932, J. Helminth. 10:76) does not appear to regard this worm as congeneric with that described by Steinbuch (1799, Der Naturforscher 28:256) as *Vibrio tritici* (= *Anguillulina tritici*, = *Tylenchus tritici*).

Study of Scopoli's paper (1777, Introductio ad Historiam naturalem sistens genera Lapidum, Plantarum, et Animalium, Prague, pp. 373, 374) shows that he clearly stated that he was making a new genus; he gave host, location, an attempted description, and referred to Linnaeus.

(Quoted from Scopoli, p. 373)

> Sequor hic doctissimum Virum *Othonem Fridericum* Müllervm, qui mira industria in hac Tribu ea præstitit, quæ nemo alius. Nova tamen & a Mullerianis diversa Genera Angvinae, & Rotariae, nec non Fvriam Ill. Linn. adiungere visum est, de cuius tamen existentia dubitant etiamnum multi.

(Quoted from Scopoli, p. 374)

> *5 ANGVINA. Scop. Corpus filiforme.
> Habitat in Galla inter glumas & folliculos cerealium, directionem medullæ ita sæpe mutans, ut plura germina prodeant.
> *Mas.* brevior, pene porrecto.
> *Fem.* longior, vivipara & ovipara.
> *Neutrum* mediocre, pene & vulva destitutum, Fontana.
> Tritici grana abbreviata & rotundata Linn. in *not.* ad Chaos.

The Linnean reference (1767, Systema Naturae, p. 1326) also gave host, location and an attempted description.

(Quoted from Linnaeus, p. 1326)

> 1326 VERMES. ZOOPHYTA. Chaos.
> 354. CHAOS. *Corpus* liberum, uniforme, redivivum: Artubus sensusque organis externis nullis.
>
> Ustilago. 4. C. fructificationis vegetabilis, pulveraceum. *Munchhausv.* I. *p.* 149.
> *Habitat in destructis granis* Hordei, Tritici, Graminumque *aliorum, inque Flosculis* Tragopogonis, Scorzoneræ, *forma nigri pulveris.* Hic *pulvis aliquot dies in aqua tepente maceratus transit in* Animalcula *oblonga, hyalina, piscium instar ludentia, armato oculo videnda.* Munch. *confer. Dissert. nost. de Mundo invisibili.*
>
> TRITICI Grana *abbreviata illa & rotundata, exsiccata etiam post annos, in aqua tepidiuscula intra horulam egerminant in ascaridiformem quasi vermicucum; animatum vix dixero.*

Scopoli and Linnaeus undoubtedly referred to the same species. There is no doubt as to what species this is because the form now known as *Tylenchus tritici* = *Anguillulina tritici* is the only species found in grains of wheat causing the formation of galls (rounded) instead of grains (oblong).

The wheat eelworm was given a specific name, *Vibrio tritici,* by Steinbuch (1799, loc. cit.), basing his species on forms described by Roffredi (1775, Obs. Mem. Phys. Nat. 5 (1):1-19).

The international rules of zoological nomenclature do not invalidate old genera which have been described without a specific name being mentioned. The genera *Anguillulina* Gervais & Beneden, 1859 (type *A. tritici* (Steinbuch, 1799) Gervais & Beneden, 1859), and *Tylenchus* Bastian, 1865 (type *T. davainii* Bastian, 1865) are both congeneric with the form described under *Anguina.* The former has an identical species as type, hence *Anguina* is monotypic even though no specific name was mentioned. The type can only be *Tylenchus tritici* (Steinbuch, 1799). Since *Anguillulina* Gervais & Beneden, 1859, and *Tylenchus* Bastian, 1865, are clearly antedated by *Anguina* Scopoli, 1777, according to the rules of priority they must be considered synonyms of *Anguina.*

It is difficult to understand why Baylis & Daubney (1926, loc. cit.) and Goodey (1932, loc. cit.) failed to recognize priority in this case. Either *Anguina* should be used on the basis of priority or the rules of priority should be suspended and *Tylenchus* recognized, since the latter name is best known and most widely used. A request that *Tylenchus* be placed on the official list of genera has been sent to Dr. C. W. Stiles, Secretary of the International Commission on Zoological Nomenclature, and it is hoped that an agreement can be reached to this effect.

(2) RENAMING OF HOMONYMS

Asconema Leuckart, 1886 (type *A. gibbosum* Leuckart, 1886), is a homonym of *Asconema* Schmidt, 1880, sponge, and *Atractonema* Leuckart, 1887 = *Asconema* renamed (type *A. gibbosum* (Leuckart, 1886) Leuckart, 1887) is a homonym of *Atractonema* Stein, 1878, protozoan; the new generic name *Tripius* is proposed for *Asconema* (type *Tripius gibbosus* (Leuckart, 1886) n. comb.).

Leptodera Dujardin, 1845 (type *L. flexilis* Dujardin, 1845), is a homonym of *Leptodera* Audinet-Serville, 1839, orthopteran, and *Leptoderes* Dujardin, 1845 (= *Leptodera* renamed), is a homonym of *Leptoderes* Audinet-Serville, 1839, orthopteran; the new generic name *Agfa* is proposed for *Leptodera* (type *Agfa flexilis* (Dujardin, 1845) n. comb.).

(3) EMENDATION OF SUPERGENERIC NAMES

The original name is given first, the emended form second.

Bunoneminae Mic., 1922	Bunonematinae Mic., 1922, emend.
Angiostominae Wülker, 1923	Angiostomatinae Wülker, 1923, emend.
Ransomneminae Travassos, 1929	Ransomnematinae, Trav., 1929, emend.
Rhigonemidae Artigas, 1930	Rhigonematodae Artigas, 1930, emend.
Rhigoneminae Artigas, 1930	Rhigonematinae Artigas, 1930, emend.
Steinerneminae Filipjev, 1934	Steinernematinae Filip., 1934, emend.
Drilonemidae Pierantoni, 1916	Drilonematidae, Pieran., 1916, emend.
Allantoneminae Pereira, 1932	Allantonematinae Periera, 1932, emend.
Avioserpensinae Wehr & Chit., 1934	Avioserpentinae, W. & C., 1934, emend.
Oxystominae Micoletzky, 1934	Oxystomininae, Mic., 1924, emend.
Eurystominae ?Filipjev, 1934	Eurystomininae ?Filipjev, 1934, emend.

(4) DESIGNATION OF TYPE SPECIES

The type designated is enclosed in parenthesis.

Poikilolaimus Fuchs, 1930. (*P. micoletzkyi* Fuchs, 1930).
Rhodolaimus Fuchs, 1930. (*R. pusillus* Fuchs, 1930).
Panagrolaimus Fuchs, 1930. (*P. detritophagus* Fuchs, 1930).
Rhabdontolaimus Fuchs, 1931. (*R. corinthiacus* Fuchs, 1931).
Rhabditophanes Fuchs, 1930. (*R. brassicae* Fuchs, 1930).
Mesonema Pierantoni, 1916. (*M. acuminatum* Pierantoni, 1916).
Opistonema Pierantoni, 1916. (*O. minutum* Pierantoni, 1916).
Parasitaphelenchus Fuchs, 1930. (*P. conjunctus* Fuchs, 1930).
Chitinoaphelenchus Micoletzky, 1922. (*Aphelenchus* (*C.*) *ormerodis* (Ritzema Bos, 1891) Micoletzky, 1922 = *Aphelenchoides parietinus* (Bastian, 1865)). Subgenus, s. o. *Aphelenchoides.* Originally included species type of older genus.

Parasitylenchus Micoletzky, 1922. (*P. dispar* (Fuchs, 1914) Mic., 1922.)
Bathymermis Daday, 1911. (*B. fuhrmanni* Daday, 1911).
Limnomermis Daday, 1911. (*L. bathybia* Daday, 1911).
Mesomermis Daday, 1911. (*M. zschokkei* Daday, 1911).
Dichromadora Kreis, 1929. (*D. cephalata* (Steiner, 1916) Kreis, 1929).
Trichromadora Kreis, 1929. (*T. longicaudata* Kreis, 1929).
Paraeuchromadora Stekhoven & Adams, 1931. (*P. amphidiscata* Stekhoven & Adams, 1931).
Epsilonema Steiner, 1927. (*E. steineri* n.n.=*Rhabdogaster cygnoides* Metschn. of Steiner, 1916 and 1927; type not *E. cyrtum* Steiner, 1931 (not an originally included species).
Brachydesmodora, Allgen, 1932. (*Desmodora* (*B.*) *similis* Allgen, 1932) [subgenus].

Survival of horse strongyle eggs under anerobic conditions. John T. Lucker, U. S. Bureau of Animal Industry.

The object of the experiments reported in this paper was to determine the survival time of horse strongyle eggs under the anerobic conditions existing in a dilute mixture of feces and water. The data supplied by these experiments have some practical application because the conditions under which the experiments were performed are comparable to those obtaining in tanks employed for the storage of stable manure mixed with water. Peterson (1927, Hoard's Dairyman 72:888) reports that stable manure is frequently stored in liquid form by European farmers. He states that the usual period of storage is from a month to 6 weeks.

In the writer's experiments, a liquid suspension of horse feces was prepared by macerating fresh stable manure in small amounts of water. The mixture was screened to remove coarse particles, further diluted with water, and finally placed in one of the receptacles described later, where it remained unagitated. Portions of the sludge containing strongyle eggs were removed at certain intervals through a valve-controlled outlet at the bottom of the container. Eggs were isolated from a part of the sludge sample for immediate examination and for culturing in water, and the remaining sludge was mixed with charcoal and cultured in Petri dishes.

In the first experiment, the depth of liquid in the small metal tank which was used as a container for the mixture was about 24 inches. The tank was 17½ inches in diameter and the volume of the liquid mixture was 5,760 cubic inches. Sludge was withdrawn 7, 12, 15, 19, and 41 days after the tank was filled and, following each withdrawal of sludge, cultures were prepared and the eggs were immediately examined. In no case was there any progress in the development of viable eggs, and attempts to isolate larvae from freshly drawn sludge gave negative results. In all cases some eggs appeared to have been killed and failed to develop subsequently in water cultures, the proportion of non-viable eggs increasing with the duration of the anerobic exposure. However, despite submergence in the liquid mixture for 41 days, the majority of the eggs cultured in water hatched in the course of a day or two. Many infective larvae were recovered from a sludge and charcoal culture prepared 19 days after the container was filled. Infective larvae were recovered also from the culture prepared from sludge removed after storage for 41 days. However, the number of larvae recovered from this culture was considerably lower than that recovered from the earlier culture.

In the second experiment, the depth of the liquid in a glazed tile receptacle was 105 inches and the volume of the mixture was 8,245 cubic inches at the beginning of the experiment; the depth was reduced to about 65 inches and the volume to 5,000 cubic inches at the conclusion of the experiment, due to the withdrawal of sludge from time to time. Sludge was withdrawn after 18, 31, 45, 53 and 63 days. The results obtained in cultures are given below in tabular form:

TABLE 1.—*Effect of exposure to anerobic conditions on horse strongyle eggs in experiment 2.*

Duration of exposure *Days*	Results in cultures of eggs in water	Results in sludge and charcoal cultures
18	About 85 percent of the eggs hatched	Many infective larvae recovered
31	About 75 percent of the eggs hatched	Several infective larvae recovered
45	About 2.5 percent of the eggs hatched	7 infective larvae recovered
53	Of several hundred eggs present, 4 hatched	5 infective larvae recovered
63	Of 24,600 eggs present, 4 hatched	No infective larvae recovered

An examination of the data given in table 1 shows that horse strongyle eggs submerged for 63 days in a dilute mixture of feces and water at depths varying from about 5½ to 8 feet failed to yield infective larvae when cultured in a medium of charcoal and feces, although 0.016 percent of the eggs isolated from another portion of the same sludge sample hatched subsequently in water culture. Two of the four eggs which hatched in the latter medium yielded infective larvae. A few infective larvae were found in solid cultures prepared from eggs submerged at these depths for 45 and 53 days, respectively. Following submergence for 41 days at a depth of 24 inches, the proportion of eggs which hatched in a water culture and the number of larvae found in a solid culture medium were significantly greater than in the case involving submergence of the eggs for 45 days at greater depths. After submergence for 1 month (experiment 2) a majority of eggs were still viable and considerable numbers of larvae were recovered in a solid culture medium.

Both experiments reported in this paper and the somewhat similar experiments reported by Gackstatter (1932, Ztschr. Veterinärk. 44: 334-339) indicate that horse strongyle eggs are completely arrested in their development when they are submerged in a dilute mixture of feces and water. However, the progressive destruction of the vitality of submerged eggs, shown particularly by the writer's second experiment, is not in agreement with Gackstatter's statement to the effect that all of the originally viable strongyle eggs in partially or completely submerged mule feces retained the capability of further development despite maintenance under these conditions for from 4 to 5 weeks. The greater depths to which eggs were submerged in the writer's experiments may account for this difference in results. It is interesting to note that Zavadovskiĭ (1916, Compt. rend. Soc. Biol. 79: 595-598) found that eggs of *Ascaris equorum* were unaffected by maintenance under anerobic conditions for from 4 to 5 months.

In the experiments described in this paper, eggs were subjected to anerobic conditions, to the influences of products of the putrefaction and decomposition of the medium, and to other influences possibly unfavorable to survival and development. While no attempt was made to determine the individual effects of these various factors on the eggs, the writer assumes that the lack of oxygen in the dilute fecal mixture was largely responsible for the failure of the eggs to develop while in this medium and for the ultimate destruction of their vitality. This assumption is supported by data published by Looss in 1896 (Centbl. Bakt. [etc.], I Abt. 20: 865-870) and 1911 (Rec. School Med., Min. Ed., Egypt 4: 163-613), by Lambinet in 1903 (Bull. Acad. Roy. Méd. Belg. 4. s. 17: 534-544), by Bruns in 1904 (Klin. Jahrb. 12: 1-28), by Zavadovskiĭ in 1916 (Compt. rend. Soc. Biol. 79: 798-802) and 1927 (Arch. Entwicklmechl. Organ. 109: 14-23), by Zavadovskii and Orloff in 1927 (Arch. Entwicklmechl. Organ. 109: 750-769), by Minagawa in 1920 (Mitt. Med. Fakult. Kais. Univ. Tokyo 23: 149-170; ibidem. 23: 171-187), by Kosmin in 1928 (Tr. Lab. Exp. Biol. Zoopark Moscow 4: 207-218), by McCoy in 1930 (Am. J. Hyg. 11: 413-448), and by Nolf in 1932 (Am. J. Hyg. 16: 288-322).

Observations on the life history of *Toxascaris leonina* (Nematoda: Ascaridae). Willard H. Wright, U. S. Bureau of Animal Industry.

The prevailing conception that the life history of *Toxascaris leonina* is identical with that of *Ascaris lumbricoides* and *Toxocara canis* is apparently based on the observations of Fülleborn. Actually, Fülleborn (1922, Arch. Schiffs- u. Tropen-Hyg. 26: 59-60) expressed considerable doubt concerning this point and stated that in his opinion it was entirely possible that *T. leonina* had another mode of development. Feeding experiments carried out by the writer with albino rats, mice, guinea-pigs and dogs indicate that the larvae of *T. leonina* do not regularly migrate throughout the body of the host.

There are 4 larval stages in the life history of this parasite. Ova of *T. leonina*, maintained at a temperature of 30° C. in an atmosphere saturated with moisture, contain vermiform embryos, or 1st-stage larvae, on the 2nd day of incubation, and ensheathed, infective embryos, or 2nd-stage larvae, on the 3rd day of incubation. Unlike the ova of *T. canis*, ova of *T. leonina* are able to develop to infective, 2nd-stage larvae, at a temperature of 37° C., in an atmosphere saturated with moisture.

Evidence indicates that when ova containing 2nd-stage larvae are ingested by the host, the ova usually hatch in the duodenum. The first ecdysis occurs at the time of hatching or shortly thereafter. The liberated larvae then penetrate into the wall of the small intestine, particularly that of the lower part of the duodenum, and come to rest in the crypts of Lieberkühn, in the submucosa and in the circular muscle of the wall. The larvae undergo considerable growth while in the intestinal wall and begin to emerge about the 9th or 10th day after infection. It is probable that the 2nd ecdysis occurs on emergence or shortly before emergence of the larvae, as we have recovered exsheathed 3rd-stage larvae from the mucosa of the duodenum on the 10th day after infection. The genital primordium of 3rd-stage larvae recovered from the lumen of the intestine of a dog 10 days after infection contained 8 cells, indicating that the larvae were in the early 3rd-stage. Larvae at this stage were 0.669 to 0.795 mm long. Later 3rd-stage larvae were recovered from the lumen of the small intestine of a dog killed 14 days after infection. These larvae were 0.794 to 0.890 mm in length, and the genital primordium contained 16 cells. Following their reentrance into the lumen of the small intestine, the larvae grow rapidly and by the 18th day after infection some of them have undergone the 3rd ecdysis. The 4th-stage larva later molts to become an adult.

Occasionally, particularly in very heavy infestations, some larvae will penetrate the wall of the small intestine and develop in the abdominal cavity, or reach such organs as the mesenteric lymph nodes, pancreas, liver and lungs. Larvae in these locations are capable of developing into 3rd-stage larvae, as larvae recovered from these organs have been in the same stage of development as those recovered from the lumen of the small intestine in the same length of time after infection. Larvae which reach the lungs are capable of finding their way into the trachea, where they are carried upward, are swallowed and again reach the small intestine, and such larvae probably develop to maturity.

A note on the identity of *Nematodirus tarandi* Hadwen, 1922, and *Nematodirus skrjabini* Mitzkewitsch, 1929 (Nematoda: Trichostrongylidae). G. Dikmans, U. S. Bureau of Animal Industry.

On comparing the published figures of *Nematodirus skrjabini* described as a new species by Mitzkewitsch in 1929 from the reindeer with specimens of *Nematodirus tarandi* Hadwen, 1922, in the National Museum Helminthological Collection, I find that these 2 nematodes are identical. *Nematodirus skrjabini* Mitzkewitsch, 1929, therefore, becomes a synonym of *Nematodirus tarandi* Hadwen, 1922.

An unidentified nematode from the eye of the moose, *Alces americana*. G. Dikmans and E. E. Wehr, U. S. Bureau of Animal Industry.

A short time ago Dr. C. P. Fitch, Chief of the Veterinary Division, College of Agriculture, University of Minnesota, sent to the U. S. Bureau of Animal Industry 2 nematodes, collected by Dr. Fenstermacher from the eyes of moose in northern Minnesota. The worms submitted for examination were immature females, about 40 mm long and threadlike. The head is without buccal capsule or circumoral elevation, and the genital opening is in close proximity to the anal opening in the posterior part of the body.

As far as we are able to ascertain only 2 genera of nematodes have been reported as parasites of the eye of ruminants, viz., *Setaria* and *Thelazia*. The worms from the eye of the moose do not belong in either of these genera because in *Setaria* the mouth is surrounded by a chitinous peribuccal ring, and in *Thelazia* there is a small buccal capsule, and in both *Setaria* and *Thelazia* the vulva is located in the esophageal region. The structure of the head of the nematode collected from the eye of the moose resembles that of members of the Metastrongylidae, and the appearance of the tail end is similar to that of members of the Protostrongylinae. There is one genus in this subfamily, viz., *Elaphostrongylus* which appears to be a tissue parasite. This genus has now 2 species, *Elaphostrongylus cervi*, reported by Cameron from the connective tissues between the latissimus dorsi and the external intercostal muscles of the Scottish red deer, *Cervus elaphus*; and *Elaphostrongylus odocoilei* reported by the Hobmaiers from the connective tissues of the black-tailed deer, *Odocoileus columbianus*. Since these worms are tissue parasites they probably do considerable wandering before reaching their final destination. It is possible that the worms recovered from the eye of the moose belong in this genus. An interesting point in connection with *Elaphostrongylus odocoilei* is that this nematode is described as a lungworm, the authors claiming that eggs and larvae were found in nodules in the lungs, and adults were embedded in the connective tissues of the vessels beneath the spine and their nearby branches, in the muscles surrounding the body cavity and along the vessels of the upper part of the hind legs. The authors further state that ordinarily the worms were coiled up in the lymphatic spaces in the connective tissues and that some specimens were found penetrating the walls of larger veins of the hind legs. Accumulations of eggs were found in these places and in lymphatic vessels.

Nematode parasites of the Saiga antelope, *Saiga tatarica*. G. Dikmans, U. S. Bureau of Animal Industry.

The following nematodes have been collected from the viscera of a Saiga antelope submitted to the U. S. Bureau of Animal Industry for examination on November 20, 1934: *Camelostrongylus mentulatus* (*Ostertagia mentulata*), *Haemonchus contortus*, *Trichostrongylus axei*, *Trichostrongylus colubriformis*, *Nematodirus* sp., and *Trichuris* sp. The host catalogue of the Zoological Division contains no record of any nematodes having been collected from this animal. According to authorities of the National Museum, the Saiga antelope is becoming a rare animal. It formerly ranged the eastern part of Russia and the western part of Siberia; its present range appears to be much smaller. The animal from which the above mentioned nematodes were obtained was 1 of a shipment of 3 imported from Russia for the National Zoological Park. According to a letter received from the importers, these antelopes had been caught in the Kalmuck Steppe in South Russia, shipped to the Zoological Park in Moscow, and then transferred to a Zoological Park in Hannover, Germany. They remained in Hannover 3 months. The nematode infection may, therefore, have been acquired, at least in part, since their capture in Russia.

A note on *Nematodirella* (Nematoda: Trichostrongylidae) from three different hosts. G. DIKMANS, U. S. Bureau of Animal Industry.

The genus *Nematodirella* Yorke and Maplestone, 1926, was first reported from the reindeer, *Rangifer tarandus*, by Romanovitch (1915) under the name of *Microcephalus longissime spiculatus*. It has since been collected from the moose, *Alces americana*, and from the antelope, *Antilocapra americana*. It is a trichostrongylid characterized by the presence of very long, filiform spicules in the male, and by the atrophy of the anterior portion of the genital apparatus in the female. The figure on page 144 of Mitzkewitsch's paper on the trichostrongylid fauna of the reindeer, purporting to illustrate the ovejectors of *Nematodirella longispiculata*. is undoubtedly an error. This figure shows anterior and posterior ovejectors both functioning normally, whereas in *Nematodirella* the anterior ovarian complex is always sterile. It is probable that the ovejectors of *Nematodirus tarandi* Hadwen, 1922 (Syn. *Nematodirus skrjabini* Mitzkewitsch, 1929), were unintentionally substituted for those of *Nematodirella longispiculata*.

Some time ago Dr. W. E. Swales of the Institute of Parasitology, MacDonald College, McGill University, Quebec, Canada, called my attention to the difference in length of the spicules in specimens of *Nematodirella* collected from the moose and from the prong-horned antelope. I have, therefore, compared specimens of *Nematodirella* collected from 3 different hosts, viz., reindeer, moose and prong-horned antelope, as to the length of spicules, length of body of male, length of bursa and length of posterior ovejector in female with the following results:

TABLE 1.—*Size variations in Nematodirella longispiculata from different hosts.*

Host	Length of male	Length of spicules	Length of bursa	Length of posterior ovejector
Rangifer tarandus	13.5-18 mm	8.5-10.5 mm	200-225μ	6-8 mm
Alces americana	10-16.5 mm	6.25-8 mm	140-150μ	4-6 mm
Antilocapra americana	13-16 mm	4-5 mm	140-150μ	3-4 mm

While the measurements here given, with the exception of those of the spicules, may not be entirely accurate, because not all the material was fixed in the same manner, and the material available for examination from both the moose and the antelope was in a very poor state of preservation, except for a few specimens collected from the moose by Dr. Swales, yet I believe them sufficiently accurate for the purpose of comparison.

On the basis of spicule length, specimens of *Nematodirella* from these 3 different hosts appear to fall in 3 groups, with the maximum length of the spicules of those from antelope approaching the minimum length of spicules of those from moose, and the maximum length of spicules of those from moose approaching the minimum length of spicules of those from reindeer. The bursa of the specimens collected from

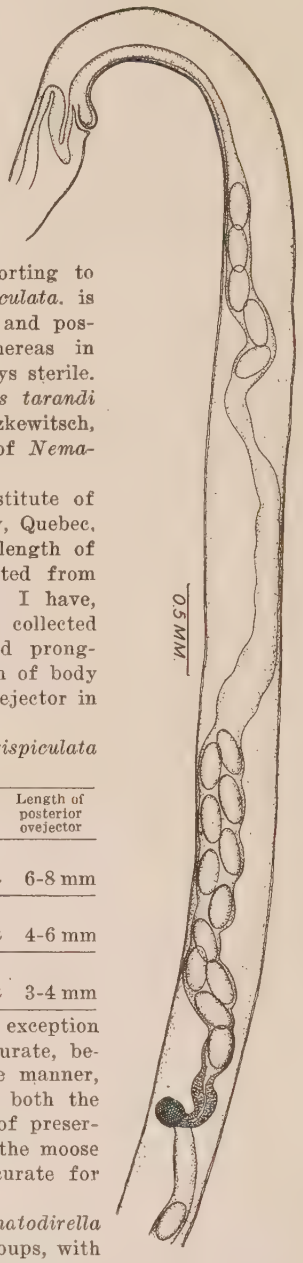

FIG. 9. *Nematodirella longispiculata longispiculata*, Posterior ovejector.

the reindeer is somewhat larger than the bursa of the specimens collected from the moose and antelope, which are alike. As far as the length of the posterior, functional ovejector is concerned, we have a situation similar to that obtaining for the spicules. Morphologically there appears to be no difference in the structures mentioned except for size. I am, therefore, not inclined to give these nematodes different specific names but I do believe that the differences obtaining among them should be recognized by the addition of subspecific names as follows: For the form from the reindeer, *Nematodirella longispiculata longispiculata;* for the form from the moose, *Nematodirella longispiculata alcidis;* for the form from the antelope, *Nematodirella longispiculata antilocaprae.*

Lungworms collected from deer, *Odocoileus virginianus*, in Michigan. G. Dikmans, U. S. Bureau of Animal Industry.

A little over a year ago the U. S. Bureau of Animal Industry began to receive correspondence from the Conservation Department of Michigan concerning the prevalence and identity of lungworms infesting deer in the upper peninsula of Michigan. At first only material containing eggs and larvae was received for examination. The larvae resembled the larvae of members of the Protostrongylinae, but it was, of course, impossible to make a specific determination on the basis of these larvae. Later, the posterior portion of a male and an entire female were received for study. These were identified as a species of *Protostrongylus.* Shortly thereafter additional specimens were received and identified as *Dictyocaulus filaria.* Next 3 sets of lungs from deer were received and examined. From these lungs was collected a nematode which has been placed in the genus *Pneumostrongylus.* Later the Zoological Division received from the University of Michigan through the Biological Survey some nematodes collected from the lungs of deer and these were identified as *Dictyocaulus viviparus.* Therefore, at the present time, there have been collected from the lungs of deer in Michigan 4 nematodes representing 3 genera, viz., *Protostrongylus, Dictyocaulus* and *Pneumostrongylus.*

New avian and insect hosts for *Gongylonema ingluvicola* (Nematoda: Spiruridae). Eloise B. Cram, U. S. Bureau of Animal Industry.

In the undilated esophagus of a captive mountain quail (*Oreortyx picta*), which died soon after it had been shipped from Oregon to Frederick, Md., there were found 2 female and 1 male specimens of *Gongylonema ingluvicola.* Embryonated eggs from the uteri of the worms were fed to 2 laboratory-reared cockroaches (*Blattella germanica*); 34 days later the cockroaches were killed and contained larvae tightly coiled in cysts in the body cavity. The cysts were slightly oval, measuring about 670 by 545μ, opaque, thick-walled; the coil of the body showed no reversal of direction, during its course, as with some other avian spirurids. The 3rd-stage larvae of *G. ingluvicola* recovered from the cysts measured 1.67 mm long by 75μ in greatest width; 2 very flat lateral lips gave appearance of an annular thickening around mouth, followed by shallow vestibule about 6μ deep. Total length of pharynx and esophagus, 1.17 mm, thus somewhat over two-thirds total body length; excretory pore, 175μ from head end. Tail short and blunt, anus 88μ from end; 2 or 3 inconspicuous conical papillae at tip of tail. These measurements show only moderate variations from those of *G. scutatum,* after development of the larvae for 7 weeks in the cockroach, as given by Ransom and Hall, as follows: Cysts 0.5 mm in diameter; larvae 1.9 mm long by 60μ wide; total length of pharynx and esophagus 1.235 mm; excretory pore 210μ from head end; anus 90μ from tail end. Five larvae of *G. ingluvicola* were fed to a chicken but without subsequent development, no worms being found when the chicken was killed 79 days later.

Additional notes on two bat parasites, *Dicrocoelium lasiuri* McIntosh, 1933 (Trematoda: Dicrocoeliidae) and *Litomosa americana* McIntosh, 1932 (Nematoda: Filariidae). Allen McIntosh, U. S. Bureau of Animal Industry and Gertrude E. McIntosh.

Two parasites previously reported only in abstract form (McIntosh, 1933, J. Parasitol. 20: 137-138; 1932, J. Parasitol. 19: 170), are described here in greater detail.

Dicrocoelium lasiuri McIntosh, 1933

Description.—Body lancet-shaped, 2.47 mm long by 650μ wide, anterior sucker 160μ and acetabulum 170μ in diameter, respectively, the latter about 570μ from anterior end. Pharynx 62 by 60μ, apparently preceded by short prepharynx and followed by slightly longer esophagus. Ceca slightly undulating, extending about 2/3 length of body; lemon yellow cuboidal crystals of some substance noted in ceca of living specimens, which did not dissolve in processes of fixation and mounting. Excretory bladder Y-shaped, with a very long stem extending from level of cecal tips to excretory pore. Testes 140 to 190μ in diameter, subtriangular, lobed or irregular in outline, situated somewhat obliquely. Vasa efferentia uniting near level of anterior margin of acetabulum, forming short vas deferens and passing immediately into cirrus sac; each vas efferens slightly expanded near its middle and filled with spermatozoa. Cirrus sac 210 by 125μ, between acetabulum and intestinal fork, containing coiled seminal vesicle. Genital pore at fork of intestine, 340μ from anterior end of body. Ovary 200 to 210μ in diameter, somewhat irregular in outline, immediately caudal to posterior testis. Laurer's canal and Mehlis' gland present. Vitellaria in zone occupied by postovarian portion of ceca, arranged in 2 lateral groups of approximately 20 follicles each. Uterus filling posterior portion of body and extending anteriorly in median field to genital pore. Metraterm to right of cirrus sac. Eggs 38 by 22μ.

Type specimen.—U.S.N.M. Helm. Coll. No. 40241; paratypes No. 40242.

Habitat.—Gall bladder and biliary tubules of liver of *Lasiurus borealis*, Washington, D. C.

Remarks.—This parasite was described from 15 specimens collected September 15, 1933, from a bat found at the base of the Washington Monument. Only one bat of several specimens, representing three species, was infected. *Dicrocelium lasiuri* differs from *D. rileyi* Macy, 1931, a closely related form, taken from specimens of a western bat captured in Oklahoma and Kansas, in that the ovary of *D. lasiuri* is as large as, or larger than, the testes, while the ovary of *D. rileyi* is much smaller than the testes; *D. lasiuri* has twice as many vitelline follicles as *D. rileyi*. In Macy's key (1931, J. Parasitol. 18: 28-33), *D. lasiuri* will key out with *D. panduriforme* Raillet, 1900. The latter, however, is a bird parasite having a huge acetabulum. In addition to comparing our material with Macy's type specimen, several individuals of *D. rileyi*, collected in Texas and in Dr. P. D. Harwood's collection, were also examined. The differences between *D. rileyi* and *D. lasiuri* noted above were fairly constant in all specimens examined.

Fig. 10

Dicrocoelium lasiuri McIntosh, 1933, ventral aspect.

In addition to *Dicrocoelium rileyi* and *D. lasiuri*, two other species belong-

ing to the family Dicrocoeliidae have been reported from chiropterans, *Platynosomum philippinorum* Tubangui, 1928 (Philippine J. Sci. 36: 367-368), from a Philippine bat, and *Dicrocoelium hospes* Looss, 1907, of Northup, 1928 (J. Burma Research Soc. 18: 80-97), from two species of bats in Burma. From the few words of description given by Northup it is evident that the species is not *D. hospes*, but her description is too inadequate to distinguish it from the other species described from bats.

Litomosa americana McIntosh, 1932

Description.—*Male* 12 mm long by 110μ wide, attenuated posteriorly. Head bluntly rounded; oral opening oval, laterally elongated, bounded by an oral membrane; buccal cavity 28μ long by 20μ in diameter, conical, with apex directed posteriorly. Cephalic papillae of external circle consisting of medium-sized dome-shaped laterodorsals and lateroventrals, and of small dorsodorsals and ventroventrals; internal circle represented by 2 small internolaterals. Amphids lateral, slightly more posterior than laterodorsals and lateroventrals. Esophagus cylindrical, 300 to 350μ long by 40 to 50μ wide; nerve ring and excretory pore in region of 2nd fourth of esophagus. Spicules unequal; left 260μ long by 8μ wide, ending distally in a long lash, right 90μ long by 7μ wide, terminating in short bipartite process. Posterior part of body with 2 to 3 spiral coils; anus 95μ from tip of tail; tail tapering gradually, rounded at tip. *Female* head, buccal cavity, and tail similar to those of male. Vulva near level of nerve ring, 150μ from anterior extremity; ovejector long. Sheathed microfilariae in blood, 80 to 90μ long by 5 to 7.5μ wide.

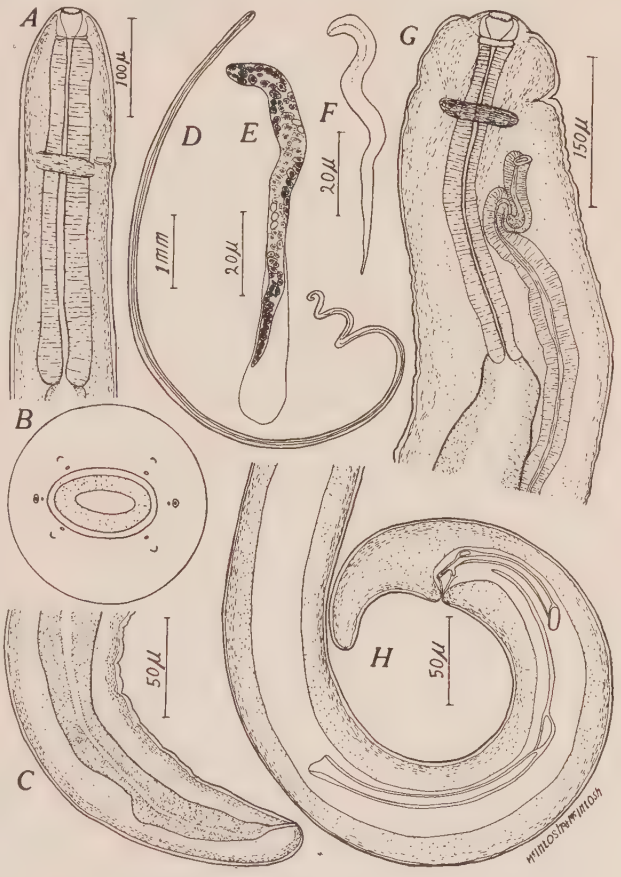

FIG. 11. *Litomosa americana* McIntosh, 1932.

A—Male, esophageal region. B—Head, *en face* view showing oral membrane, cephalic papillae and amphids. C—Fmale tail. D—Male, complete worm. E—Microfilaria, sheathed, from blood of bat. F—Microfilaria, from uterus of female worm. G—Female, esophageal region showing position of vulva and ovejector. H—Male, tail showing spicules.

Type specimen.—U. S. N. M. Helm. Coll. No. 34160 (male); paratype No. 40243 (2 males and 1 female).

Habitat.—Abdominal cavity of *Nycticeius humeralis*, Washington, D. C.

Remarks.—The above filariid was described from 4 males and 1 female collected by the writers from 2 specimens of bats, *Nycticeius humeralis*, taken September 28, 1932, at the base of the Washington Monument. The female

and a male were somewhat mutilated on opening the abdominal cavity of the host, and because of the damage to the female it was impossible to make as thorough a study of this sex as might be desired. The host is apparently a rare visitor to the District of Columbia, since in more than 2 years of collecting no additional specimens of *Nycticeius humeralis* have been captured. Mr. Gerrit S. Miller, Jr., of the U. S. National Museum, who kindly identified the hosts for the 2 parasites reported in this paper, stated at the time of identification that very few specimens of *Nycticeius humeralis* had been received from the District of Columbia. Two other species of bats, *Lasiurus borealis* and *Eptesicus fuscus*, taken from the same location did not harbor filariids.

Genus *Litomosa Yorke and Maplestone*, 1926

The type species of this genus is *Litomosa filaria* (v. Beneden, 1873) Yorke and Maplestone, 1926, which was described from a European species of bat. A second species, *L. chiropterorum* Ortlepp, 1932, was described from South African bats captured in caves in Pretoria. *L. americana* McIntosh, 1932, was the third species to be placed in the genus *Litomosa*. A fourth species, *L. witei* Krepkogorskaja, 1933, emend. (= *L. wite* Krepk., 1933) was described from a rodent from Kasakstan.

The four species may be separated with the aid of the following key:

1. Buccal capsule flask-shaped; male tail without terminal spikes; female tail with only 2 terminal processes.....*L. chiropterorum*
   Not with above combination of characters..... 2
2. Buccal cavity conical with apex directed posteriorly; tails of male and female without terminal processes.....*L. americana*
   Buccal cavity infundibuliform with apex directed anteriorly; tail with terminal spikes or processes..... 3
3. Vulva at level of posterior end of esophagus; female tail with 1 pair of small divergent terminal processes between which are 2 minute spines; male tail with subterminal spike.....*L. filaria*
   Vulva 140 to 180μ posterior to level of posterior end of esophagus; female tail terminating in 2 lateral processes between which is a somewhat larger dorsal process, the intervening space between the processes covered with a number of fine tubercules; male unknown.....*L. witei*

Tropical rat mite attacking man in St. Louis area. Allen McIntosh, U. S. Bureau of Animal Industry.

Several mites were received December 10, 1934, from Dr. C. F. Payne, inspector in the Meat Inspection Division of the U. S. Bureau of Animal Industry, with the following note:

"These parasites were obtained from employees in the office of the ———— Commission Company, National Stock Yards, Illinois, from clothing and from arms and legs. Employees of this firm have been complaining for the past month of a condition somewhat resembling harvest or chigger mite bites. The employees' arms and legs appear as if they had been subjected to severe chigger or mosquito bites. Similar conditions are being reported from dressing rooms in the public stock yards and around scale houses. One case was reported from the ———— Packing Company, where a watchman was complaining of a similar condition to the employees in the ———— Commission Company's office.

"The employees in the ———— Commission Company state that they find parasites in the desk drawers, on their clothing, arms and legs, and in linen closet. The ones forwarded in the bottle were obtaied from the linen closet and it appears as if they have been engorged with blood from a host other than human beings, possibly rats.

"As the season of the year appears past for the prevalence of the chigger mite, and with the possibility that these parasites may be the carrier of some diseased condition, it is thought that the existence of these parasites here might be of interest to the public health service."

The mites were identified by the writer as *Liponyssus bacoti* Hirst, 1914. This mite has recently been shown experimentally by Dove and Shelmire (1932,

J. Parasitol. 18: 159-168) to transmit endemic typus. In the above reference Dove and Shelmire pointed out that from their reports this mite probably occurs in St. Louis, Missouri. This note is given here to establish definitely the fact that the tropical rat mite does occur in the St. Louis area.

A new trematode, *Lyperosomum monenteron*, n. sp. (Dicrocoeliidae), from a robin. E. W. PRICE and ALLEN MCINTOSH, U. S. Bureau of Animal Industry.

About three years ago, Mr. Alex. D. Baker, MacDonald College, Quebec, forwarded to the U. S. Bureau of Animal Industry a number of trematodes for identification. Among these were several specimens from a robin, *Turdus migratorius*, which appeared to represent a new species belonging to the genus *Lyperosomum* Looss. Subsequently 3 additional lots of specimens have been secured, one from Mr. L. M. Dickerson collected from a robin at Charlottesville, Va., another collected by one of us (A. M.) from the same host at Washington, D. C., and a third from a bluebird found dead at Falls Church, Va.

Lyperosomum monenteron, n. sp.

Description.—Body lanceate, 1.9 to 5.2 mm long by 630 to 670μ wide at level of acetabulum, narrowing more or less abruptly in preacetabular region, and with short, lip-like projection dorsal to oral sucker; cuticula smooth. Oral sucker subterminal, 120 to 170μ long by 123 to 150μ wide; acetabulum 170 to 320μ long by 200 to 320μ wide, about 1/5 of body length from anterior end. Pharynx subglobular, 42 to 60μ long by 50 to 70μ wide, its anterior end in contact with oral sucker; esophagus slender; intestine single, extending between testes and between posterior testis and ovary, then continuing in more or less wide undulations (undulations wider, as a rule, than shown in illustration) and terminating blindly about 1/3 of body length from posterior end. Excretory aperture terminal; excretory vesicle tubular, extending anteriad to about level of anterior limits of vitellaria, then bifurcating and forming short lateral limbs; remainder of excretory system not observed. Genital aperture median, about midway between anterior margin of acetabulum and tip of body, its position varying somewhat, depending on amount of extension or contraction of preacetabular portion of body. Cirrus pouch elongate piriform to pestle-shaped, 160 to 320μ long by 65 to 100μ wide, containing a relatively long, folded seminal vesicle, a small pars prostatica, and cirrus. Testes transversely oval, 140 to 260μ long by 250 to 460μ wide, one diagonally in front of other in posterior part of anterior third of body. Ovary transversely oval, 90 to 125μ long by 100 to 220μ wide, posttesticular and to right of median line. Seminal receptacle globular or piriform, median, at level of posterior margin of ovary; Mehlis' gland moderately developed, postovarial; Laurer's canal long and slender, opening dorsal to ovary. Vitellaria in equatorial zone, consisting of relatively large follicles tending to meet anteriorly in median line. Uterus with greatly convoluted descending and ascending limbs, filling greater part of postovarial portion of body. Eggs 32μ long by 16μ wide.

FIG. 12. *Lyperosomum monenteron*, n. sp., dorsal view.

Host.—*Turdus migratorius* and *Sialia sialis*.

Location.—Gall bladder and bile ducts.

Distribution.—United States and Canada.

Specimens.—U. S. N. M. Helm. Coll. Nos. 40237 (type), 40238 (paratypes), 40239, 40240 and 34337.

This species differs from other species of the genus in having a single intestinal cecum. It is not improbable that some of the other species that have been assigned to the

genus *Lyperosomum* by various workers may show this feature, but it appears not to have been mentioned. Some of the descriptions and illustrations of species indicate that the specimens studied were in such poor condition that it was possible to make out only the more obvious characters. Such descriptions and figures make it virtually impossible to determine the validity of many of the species.

***Mesocoelium danforthi*, n. sp. (Dicrocoeliidae), from a lizard, *Celestus pleii*, in Puerto Rico.** W. A. HOFFMAN, School of Tropical Medicine, San Juan, P. R.

This work was done in the laboratory of the Zoological Division of the U. S. Bureau of Animal Industry, Washington, D. C. The writer is indebted to Dr. E. W. Price for aid and counsel rendered during the course of this study.

Mesocoelium danforthi, n. sp.

Description.—Body elongate oval, 1.31 to 1.65 mm long by 0.54 to 0.58 mm wide, posterior end slightly more rounded than anterior; cuticula apparently without spines. Oral sucker subterminal, slightly longer than wide, 0.296 to 0.300 mm wide by 0.328 to 0.336 mm long, covered by a membrane with a longitudinal median slit. Acetabulum nearly circular, 0.148 to 0.172 mm in diameter; longitudinal diameter about half that of oral sucker, its anterior margin situated near junction of anterior and median thirds of body length. Prepharynx present, indistinct; pharynx semiglobular, about 0.110 by 0.088 mm. In all specimens examined the esophagus is so short as to appear nonexistent. Intestinal ceca extending horizontally, curving at an angle of almost 90 degrees, and then running parallel to lateral margins, barely attaining posterior third of body. Only posterior portion of excretory vesicle visible. Genital pore at level of base of pharynx; cirrus pouch narrowly piriform, about 0.146 mm long, its base beneath anterior margin of acetabulum. Testes broadly ovoid, 0.104 to 0.108 by 0.072 to 0.076 mm, situated obliquely on either side of acetabulum, one slightly anterior and the other somewhat posterior to it. Ovary subspherical, 0.100 to 0.136 mm by 0.08 to 0.096 mm, immediately behind and sometimes contiguous with right testis. Vitellaria extending from level of oral sucker into proximal portion of posterior third of body, terminating just beyond ceca. Seminal receptacle, yolk reservoir and transverse vitelline ducts not discernible, obscured by the numerous ova filling posterior half of body.

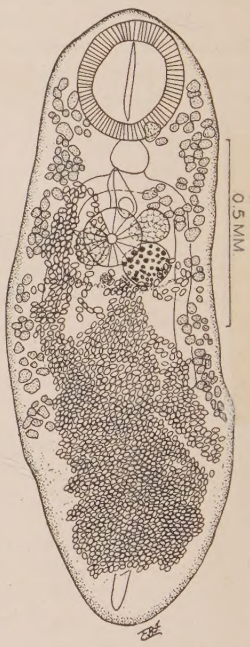

FIG. 13. *Mesocoelium danforthi*, n. sp., ventral view.

Habitat.—Intestine of a lizard, *Celestus pleii*, collected by Dr. S. T. Danforth at El Yunque, a mountain in the Luquillo National Forest, Puerto Rico, March 29, 1934; captured at altitude of 2000 ft.

Specimen.—U. S. N. M. Helm. Coll. Nos. 39570 (type) and 39571 (paratypes).

Mesocoelium danforthi is closely allied to *M. sociale* (Lühe, 1901), *microon* Nicoll, 1914, *americanum* Harwood, 1932, *meggitti* Bhalero, 1927, and *monodi* Dollfus, 1929. From all these, *danforthi* differs in having the longitudinal diameter of the oral sucker approximately twice that of the acetabulum, in the small size of its eggs, and with possible exception of *americanum*, in its ovary being larger than either testis. The cirrus pouch of *americanum* does not extend to the acetabulum, as it does in the case of *danforthi*.

A note on the life history of *Telorchis robustus* Goldb. (Trematoda: Telorchiidae). WENDELL H. KRULL, U. S. Bureau of Animal Industry.

Experiments have been conducted to determine the life history of *Telorchis robustus*, a trematode parasite of the common land turtle, *Terrapene carolina*. The turtle from which the material used in these experiments was obtained was collected and the flukes determined by Mr. Allen McIntosh of the Zoological Division.

Eggs of the parasite were obtained from mature specimens of the fluke and fed to laboratory-raised snails, *Pseudosuccinea columella*. The snails became infected and cercariae were shed by the first snail 28 days after exposure to infection, and all snails were shedding cercariae 4 days later.

The cercaria, a xiphidiocercaria, is spined anteriorly, and has 4 penetration glands on one side and 5 on the other. The excretory bladder is Y-shaped, the main excretory tubes entering the cornua near their posterior ends. A pocket or vestibule is present at the posterior end of the body, which contains the excretory pore and in which the simple tail is fastened. The cuticula of the 2 dorsolateral portions of the cavity is greatly thickened, and each thickened area is provided with about 50 long spines which project into the cavity.

Laboratory-raised *Pseudosuccinea columella*, *Helisoma trivolvis* and *Lymnaea traskii* were exposed to the cercariae and became infested, the cercariae penetrating the exposed portions of the snails. Encysted metacercariae were subsequently found in almost any soft part of the snail; they were never abundant, even though the snails had been exposed repeatedly to thousands of cercariae.

The experiments demonstrated that *Pseudosuccinea columella* may serve as first and second intermediate hosts, and *Helisoma trivolvis* and *Lymnaea traskii* as second intermediate hosts for this fluke. Further details of the life history and complete descriptions of the larval stages will be given later.

Minutes.

One hundred sixty-fifth to one hundred sixty-seventh meetings.

The 165th meeting was held on October 20, 1934, at Beltsville, Md., on the occasion of the dedication of the new Zoological Division laboratory. Officers were elected as follows: President, L. A. Spindler; Vice President, E. E. Wehr; Recording Secretary, G. Dikmans; Corresponding Secretary-Treasurer, Miss Edna M. Buhrer. No program was presented at this meeting.

The 166th meeting was held at the School of Hygiene, Baltimore, Md., on November 17, 1934. A paper was presented by Dr. Cram. Informal notes were presented by Miss Wolfson and by Messrs. Alicata, Bartsch, Andrews, Atchley, Otto, and Spindler. Dr. Cram's paper appears in this issue.

The 167th meeting was held on December 15, 1934. Papers were presented by Mrs. Chitwood and Mrs. Cobb and by Messrs. Chitwood, Dikmans, Krull, Lucker, McIntosh, Price, Steiner, and Taylor. (See this issue.) The financial report was presented by Mr. E. E. Wehr. Dr. Christie called attention to the fact that "A key to the genera of free-living nemas" which appears in this issue, is the 27th and concluding number of "Contributions to a science of nematology" by N. A. Cobb. Any one wishing to purchase a complete set of this series should communicate with Miss Margaret V. Cobb, Tilton, N. H.

G. DIKMANS, *Secretary.*

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